PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

JUN 1 - 1937

MAY, 1937

Journal of Educational Research

Registered June 4, 1920

CONTENTS

		PAGE
The Adaptability of Psychological Techniques to the Study of Schoolroom Learning	*Robert A. Davis*	663
Areas of Human Activity	*O. I. Frederick* and *Lucile J. Farquear*	672
Two Methods of Teaching High School Algebra: A Criticism	*Carleton Washburne*	680
Sixth Grade Health Awareness in Massachusetts	*Fredrika Moore* and *Angeline Hamblen*	684
Predicting Performance in College English	*Mazie Earle Wagner* and *Eunice Strabel*	694
A Method for Reducing Failures in Plane Geometry	*J. Landon Hamilton*	700
A Note on "The Life-Career Motive and Its Effect on College Work"	*M. V. Marshall*	703
Editorial: A Measuring Tool to Aid Instruction	*An Observer*	704
Reviews		707
Research Abstracts and Bibliographies		711
Research News and Communications		715

THE JOURNAL OF EDUCATIONAL RESEARCH is indexed in the Education Index

Copyright 1937, by Public School Publishing Co.

Entered as second-class matter at the Post Office at Bloomington, Illinois, under the act of March 3, 1879

JOURNAL OF EDUCATIONAL RESEARCH

EDITORIAL BOARD

A. S. BARR, *Chairman, Professor of Education, University of Wisconsin, Madison, Wisconsin.*

E. J. ASHBAUGH, *Dean, College of Education, Miami University, Oxford, Ohio.* Administration, Supervision, and Teacher Training.

HARRY J. BAKER, *Director, Psychological Clinic, Detroit Public Schools, Detroit, Michigan.* Child Welfare, Guidance, and Development.

LEO J. BRUECKNER, *Professor of Education, University of Minnesota, Minneapolis, Minnesota.* Elementary Education.

CARTER V. GOOD, *Professor of Education, University of Cincinnati, Cincinnati, Ohio.* Teaching, Learning, and Individual Differences.

KAI JENSEN, *Associate Professor of Education, University of Wisconsin, Madison, Wisconsin.* Preschool Education.

CHARLES W. KNUDSEN, *Graduate School of Education, Harvard University, Cambridge, Massachusetts.* Secondary Education.

A. K. LOOMIS, *c/o Board of Education, Shaker Heights, Cleveland, Ohio.* Curriculum Construction.

CLIFFORD WOODY, *Director, Bureau of Educational Reference and Research and Professor of Education, University of Michigan, Ann Arbor, Michigan.* Measurements, Statistics, and Research.

To save time, manuscripts may be sent directly to members of the editorial board as indicated above.

ASSOCIATE EDITORS

FRED C. AYER, *Professor of Educational Administration, University of Texas, Austin, Texas.*

PHILIP A. BOYER, *Director of Educational Research, School District of Philadelphia, Philadelphia, Pennsylvania.*

FOWLER D. BROOKS, *Head of Departments of Education and Psychology, DePauw University, Greencastle, Indiana.*

WILLIAM A. BROWNELL, *Professor of Educational Psychology, Duke University, Durham, North Carolina.*

B. R. BUCKINGHAM, *Lecturer in Education, Harvard University, Cambridge, Massachusetts.*

W. W. CHARTERS, *Director, Bureau of Educational Research and Professor of Education, Ohio State University, Columbus, Ohio.*

VIRGIL E. DICKSON, *Assistant Superintendent of Schools and Director of Bureau of Research and Guidance, Berkeley Public Schools, Berkeley, California.*

EDGAR A. DOLL, *Director, Department of Research, Training School, Vineland, New Jersey.*

WILLIAM S. GRAY, *Director, Teacher Training, University of Chicago, Chicago, Illinois.*

CHARLES E. GREENE, *Assistant Superintendent of Schools, Denver Public Schools, Denver, Colorado.*

M. E. HAGGERTY, *Dean, College of Education and Professor of Education, University of Minnesota, Minneapolis, Minnesota.*

V. A. C. HENMON, *Chairman, Department of Psychology and Professor of Psychology, University of Wisconsin, Madison, Wisconsin.*

KARL J. HOLZINGER, *Professor of Education, University of Chicago, Chicago, Illinois.*

ERNEST HORN, *Director, University Elementary School and Professor of Education, State University of Iowa, Iowa City, Iowa.*

EARL HUDELSON, *Dean, College of Education and Professor of Education, West Virginia University, Morgantown, West Virginia.*

FREDERICK J. KELLY, *Chief, Section of Colleges and Professional Schools, Office of Education, Department of the Interior, Washington, D. C.*

WILLIAM A. McCALL, *Professor of Education, Teachers College, Columbia University, New York City.*

W. J. OSBURN, *Professor of Education, University of Washington, Seattle, Washington.*

SHELTON PHELPS, *President, Winthrop College, Rock Hill, South Carolina.*

DOUGLAS E. SCATES, *Director, Research and Statistics, Cincinnati Public Schools, Cincinnati, Ohio.*

JESSE B. SEARS, *Professor of Education, Stanford University, California.*

FRANCIS T. SPAULDING, *Associate Professor of Education, Harvard University, Cambridge, Massachusetts.*

JOHN L. STENQUIST, *Director, Bureau of Educational Research, Department of Education and Lecturer, Johns Hopkins University, Baltimore, Maryland.*

PERCIVAL M. SYMONDS, *Associate Professor of Education, Teachers College, Columbia University, New York City.*

W. W. THEISEN, *Assistant Superintendent of Schools, Milwaukee, Wisconsin.*

M. R. TRABUE, *Director, Division of Education, Consolidated University of North Carolina, Chapel Hill, North Carolina.*

W. L. UHL, *Dean, School of Education, and Professor of Education, University of Washington, Seattle, Washington.*

CARLETON W. WASHBURNE, *Superintendent of Schools, Winnetka Public Schools, Winnetka, Illinois.*

GUY M. WHIPPLE, *Secretary, National Society for the Study of Education, Clifton, Massachusetts.*

ELIZABETH L. WOODS, *Supervisor, Educational Research and Guidance, Los Angeles City Schools, Los Angeles, California.*

G. A. YOAKAM, *Professor of Education and Director, Courses in Elementary Education, University of Pittsburgh, Pittsburgh, Pennsylvania.*

THE JOURNAL OF EDUCATIONAL RESEARCH is published at Bloomington, Illinois, monthly, except June, July, and August by the Public School Publishing Company. The subscription price is $3.20; $3.50 in Canada or Mexico; $3.55 in South American countries; and $3.60 in other foreign countries.

Subscriptions and all communications about reprints or other business matters should be addressed to the PUBLIC SCHOOL PUBLISHING COMPANY, at Bloomington, Illinois.

Address all communications on editorial matters to A. S. Barr, Department of Education, University of Wisconsin, Madison, Wisconsin.

JOURNAL *of* EDUCATIONAL RESEARCH

Volume XXX MAY, 1937 Number 9

THE ADAPTABILITY OF PSYCHOLOGICAL TECHNIQUES TO THE STUDY OF SCHOOLROOM LEARNING

ROBERT A. DAVIS
University of Colorado

THE field of psychology has developed reliable laboratory techniques for studying learning, but the data so gathered are of limited value to the educator wishing practical information concerning the learning process. Generalizations of psychology with reference to education have been formulated from the study of progress in learning such motor skills as card sorting, ball tossing, or maze threading; or if verbal materials are used, progress in memorizing nonsense syllables, digits, words, or other semimeaningful materials. In the field of psychology learning investigations directly applicable to education are practically negligible. Nevertheless, the techniques of the laboratory, particularly as they apply to acquisition and retention, are valuable if properly adapted to schoolroom situations. The present purpose is, therefore, to study the adaptability of such techniques, outline a plan for this adaptation, and suggest avenues of approach in connection with a more intensive investigation of schoolroom learning.

I. ACQUISITION

Acquisition may be studied experimentally in two ways. One technique[1] causes the individual to react to specific units of verbal material or to a particular motor task. In such cases the learning situation remains constant and efficiency is measured by such criteria as time, trials, or errors. Curves based upon this type of study are termed "practice" because they reflect the influence of continued repetition upon the mastery of a task. In practice curves based upon either verbal or motor tasks physiological and psychological limits will be noted. Laboratory investigations of this type predominate. This technique could be used in studying schoolroom acquisition, but opportunities for its application are

[1] Robinson, E. S., and Heron, W. T. "Results of Variation in Length of Memorized Material," *Journal of Experimental Psychology*, V (1922), pp. 428-448.
Broden, S. R. "Extensive Experiment in Motor Learning and Relearning," *Journal of Educational Psychology*, XV (1924), pp. 313-315.

limited. Its chief value for the school lies in its ability to gauge improvability and potential rate of acquisition.

The other technique, which is rarely used in the psychological laboratory, analyzes cumulative growth and more closely approximates the learning situation in school subjects. This technique postulates that acquisition represents growth within large units of learning material with which forward and backward associations are being formed and in which continual reorganization of subject matter may be prerequisite to advancement. Instead of a learning task that is held constant, a situation is conceived in which the pupil is continually acquiring new units of subject matter and correlating them with the old. Stump[2] studied progress made in civics by sixteen high school pupils over a period of twenty days. The course followed an outline of broad principles with items for solution. The scores for each testing period represent the total number of items learned from the first day of the experiment. Although curves based upon these scores showing progressive growth are characterized by fluctuations, they follow a more or less steady upward rise, which may be expected to continue despite fluctuations in performance until training is completed. With acquisition thus revealed, opportunities for studying classroom learning are almost unlimited. When curves for individuals are constructed, differences in rate and accuracy of acquisition will be noted. It is also possible to study fluctuations, plateaus, influence of kinds of teaching objectives and tests, difficulty or ease of mastery of different types of material, attitudes of pupils toward subject matter, incentives and similar factors.

Most school subjects lend themselves to the technique of cumulative growth, but there are few studies in either education or psychology which show this type of progress. Studies are needed which will show cumulative progress in the acquisition of facts, in ability to interpret and to apply facts, and in the creation and modification of attitudes. Tyler's studies[3] dealing with the evaluation of experimental schools and reten-

[2] Stump, N. F. "A Classroom Experiment in Logical Learning," *Journal of Applied Psychology*, XI (1927), pp. 117-126.

[3] *Progressive Education Association Bulletins*, Columbus: Ohio State University, 1936.

See also Tyler, R. W. "Permanence of Learning," *Journal of Higher Education*, IV (1933), pp. 203-204.

Tyler, R. W. "What High School Pupils Forget," *Educational Research Bulletin*, IX (1930), pp. 490-492.

Frutchey, F. P. "Retention in High School Chemistry," *Educational Research Bulletin*, XVI (1937), pp. 34-37.

tion in school subjects have demonstrated the practicability of tests designed to measure several of the less tangible outcomes of teaching. Some of these tests are designed to measure ability to explain scientific facts, to make generalizations, and to draw conclusions from scientific data.

If measurement of this type is to be valid, objectives[4] must be established at the beginning of courses. General objectives which are broad lend themselves poorly to objective measurement, whereas specific objectives contributing to broad objectives are more tangible and therefore more readily measurable. The basic problem in the study of schoolroom learning is the formulation of measurable objectives and the construction of tests which will determine the extent of their attainment. These tests should be administered at regular periods over extended intervals, thereby insuring a basis for studying cumulative growth in the attainment of objectives.

II. RETENTION

Retention refers to the sustained effects of training, whereas acquisition refers to its cumulative effects. Efficiency of learning depends not only upon the amount acquired but also upon the amount retained of that which is acquired. Retention may be observed from two standpoints. First, the acquisition process itself may be interpreted as retention, for without ability to retain the effects of previous training in learning experiments, progress from one training period to another could not be made. In this broader sense learning is analogous to a football game in that the activities of the team playing the offensive may result in advances interspersed with regressions, the total gain in yardage exceeding losses. Snoddy[5] gave 80 students a practice series of twenty tests of mirror drawing every day for six consecutive days. The twenty trials required approximately a half hour of practice and twenty-four hours elapsed between practice periods. After the scores of these students were plotted it was shown that each day of practice was partially spent in overcoming the loss of the previous day before a new phase of growth appeared. Temporary gain was distinctly different from the more permanent improvement, a fact demonstrating simultaneous operation of ac-

[4] For an excellent discussion of the need for objectives, see Tyler, R. W. "Formulating Objectives for Tests," *Educational Research Bulletin*, XII (1933), pp. 197-206.

[5] Snoddy, G. S. *Evidence for Two Opposed Processes in Mental Growth.* New York: Science Press, 1935.

See also Courtis, S. A. "The Scientific Analysis of Learning," *School of Education Bulletin*, University of Michigan, VII (1935), pp. 3-7.

quiring and forgetting. The same principle is illustrated in Stump's[6] study of progress in learning civics.

The more frequent method of studying retention consists of: (1) measurement of initial acquisition, (2) the allowance of a definite lapse of time, and (3) remeasurement to determine the amount retained after the intervenient period. Tests immediately after acquisition probably measure acquisition rather than retention. Its essential procedure is the measurement of the effects of training and the lapse of a definite period of time between measurement and remeasurement. Retention is usually measured by the methods of recall, recognition, or relearning. Two of these methods, recall and recognition, are well adapted to schoolroom learning situations and may be illustrated by objective tests bearing the same names, whereas the relearning method is probably most useful in laboratory research.

In a limited number of schoolroom studies investigators have either: (1) determined how much was known at the end of a course or subject and how much was known at definite intervals thereafter (retention being measured by objective tests) or (2) measured the gains in a subject or course during the period of instruction (using initial and end tests) and determined how much of the gain was retained after varying periods of time. Of the two procedures the latter is obviously the more accurate. Each method, however, yields strikingly similiar results. Investigations show that in general a large amount of subject matter is forgotten within a short time, at least 50 percent within a year's period. These findings are sometimes interpreted as a direct indictment of teaching and of educational methods. It must be borne in mind, however, that almost all of these studies were designed to measure only factual information, of which some forgetting is desirable in order to free the pupil's mind of details of little significance which may be easily relearned if needed. An examination should be made of the results obtained when retention of teaching outcomes other than factual information is measured.

Investigations which include the measurement of other outcomes are limited, but tentative findings present a more optimistic picture of the permanence of schoolroom learning. Tyler[7] measured the degree of retention for several outcomes in zoology including factual information, explanation of factual information, and ability to apply known facts. His study shows that although a large percentage of factual information was

[6] Stump, N. F. *op. cit.*
[7] Tyler, R. W. *op. cit.*

soon forgotten, the ability to explain scientific concepts and to make intelligent applications showed only slight loss over extended intervals. Investigations[8] of retention of attitudes show similar results. It would appear that attitudes, methods of solving problems, and ability to make applications are the most permanent outcomes of teaching. The central problem, as in acquisition, is the formulation of objectives for various subjects and fields and the construction of tests which will measure the extent of their attainment.

III. SOME SUGGESTIONS FOR RESEARCH

Upon the assumption that acquisition and retention are basic for experimental study, the general plan, with particular reference to one school subject, may be outlined briefly as follows:

1. *The formulation of objectives for individual subjects or courses.* A clearly stated outline of objectives, reproduced for distribution to pupils, may be discussed with them during the first meeting of the course. For example, specific objectives[9] (those more susceptible to measurement) for seventh grade general science may be stated as the acquisition of facts from the textbook, the ability to explain known facts, and the ability to draw conclusions from scientific data. For the purpose of an investigation the pupils may be held responsible only for the materials of the textbook.

2. *The construction of tests which will measure the extent to which the objectives have been attained.* This step necessitates the construction of tests for measurement of factual information in general science, and of ability to explain the facts acquired, and to draw conclusions from scientific data. A textbook in general science may be examined for all basic materials and a series of tests devised to measure the degree to which the objectives have been attained. Probably the most appropriate test for the measurement of factual information is some form of the simple recall type, and of the ability to explain known facts and to draw conclusions from scientific data, some form of the recognition type. The two latter tests must be so constructed that they will satisfactorily measure the extent to which the objectives have been attained and at the same time lend themselves to objective methods of scoring. Each of these tests should cover the same material and extend to a definite page or chapter

[8] Peterson, R. C., and Thurstone, L. L. *Motion Pictures and the Social Attitudes of Children.* New York: Macmillan, 1933.

[9] It would appear from Tyler's work that these and other objectives can be measured satisfactorily.

in the text. The first series of tests made in at least two duplicate forms may consist of a certain number of simple recall items, explanation items, and generalization items. For each unit of subject matter up to the completion of the course similar series may be devised including approximately the same amount of material and the same number of items for each type of test.

3. *The administration of tests to provide a basis for studying cumulative growth.* Since the test scores are to represent the cumulative growth process in general science (the total number of items acquired and retained for two-week intervals, from the first day of the course), they should be given at regular intervals. For a seventh grade general science course of one semester the procedure may be as follows: A series of tests for measuring the extent of attainment of objectives will be given at regular two-week intervals after an initial two-week period of instruction and study. Form A of the three tests may be administered to cover the first two weeks of instruction. After another two weeks of instruction Form A of the three tests designed to cover this additional unit of subject matter may be given *and* also Form B of the series of tests which were given two weeks previously. In this manner every two-week period will witness the administration of a Form A series to measure additional acquisition and the simultaneous administration of Form B of the preceding series to determine the amount retained. The items in Form B should probably be intermingled with those in Form A in order to prevent pupils, at least partially, from detecting that retention for two-week intervals is being measured. If the textbook contains approximately 450 pages, at least nine series of tests and as many testing periods may be arranged, followed by a final examination which may well be the Form B series over the entire text. As a further check upon progress during the semester a standardized general science test may be given upon the first day of the course and a duplicate form of the test upon the last day. The pupils should, of course, be informed by written instructions of the time of the tests and of the amount of text material to be covered during each testing period.

This procedure utilizes a learning situation which approximates that of the psychological laboratory in all respects except that of controlling the amount and character of study by pupils. To control this factor supervised study periods would be necessary, but even then it would be difficult to estimate the amount of time and energy used by pupils in assimilating and digesting materials being ostensibly studied. Herein lies

a distinguishing characteristic between laboratory and schoolroom research: The laboratory situation controls both the training and testing, whereas the schoolroom may control adequately only the testing procedures.

4. *The presentation and interpretation of test results.* After the administration of the tests and their evaluation and refinement (if tests have not been statistically evaluated previously), the investigator is ready to tabulate results and to trace cumulative growth in the abilities tested. Inasmuch as retention for two-week intervals would be measured at each testing period with the exception of the first, it would be possible to study both acquisition and retention simultaneously. If progress should be plotted, both advances and regressions would doubtless be shown although the curves would show cumulative growth up to the completion of the course. There would be, on the basis of at least nine testing periods, curves of growth for factual information, curves for ability to explain scientific facts, and curves for ability to draw conclusions or to make generalizations upon scientific data. Such curves would present a clear picture of progress in general science. It would be possible to determine the growth of these abilities in their relationship to one another, to study fluctuations and plateaus, and to indicate factors contributing to uniformity or variability of performance from one testing period to another.

The investigation might be extended to include such problems as the following:

a. The problem of individual differences in acquisition. The progress of pupils might be compared according to intelligence levels, those in the highest 25 percent being compared with those of the middle 50 percent and the lowest 25 percent. Sex and age differences could be taken into account, and also the influence of training upon individual differences. Do those who are ahead at the beginning of the course maintain their lead as training continues? Does the group become more or less homogeneous with each testing period? These and kindred problems might be studied in relationship to the several objectives considered.

b. Investigation of types of learners and learning. This problem would be attended by difficulties, but the measurement of several outcomes would probably aid in identifying certain recognized types of learners and learning.

c. The study of the influence of certain guidance factors which contribute to economy in learning. An experimental group might be guided by written instructions concerning the objectives to be achieved and the

methods of evaluating its work, while a control group might study the text uninformed on these matters. One group might be informed of its scores at each testing period, while the other studies without knowledge of results. Other practical problems include the relative effectiveness of intensive and extensive reading programs, and problem-solving procedures as compared with lecture methods of teaching.

d. A comparison of progress in those subjects in which there is definitely an interdependency of materials with that in subjects in which there is little or no interdependency. In the case of some subjects it is essential that the learner master efficiently one unit of subject matter before he is able to study intelligently the next unit; in other subjects the organization of subject matter would probably make little difference in learning efficiency.

5. *The measurement of retention over extended intervals.* As already indicated, retention for short intervals would be measured simultaneously with acquisition. In order to study retention over extended intervals, however, the same pupils should be retested on the same materials by duplicate forms of previous tests for definite periods of time after the completion of the course. If this were done, it would be possible to determine the amount of factual information retained in relationship to the amount of retention of ability to explain scientific facts and to draw conclusions from scientific data. At this point might be checked tentative findings which indicate that the important outcomes of teaching are retained over long periods with slight loss. Other problems include:

a. The relationship between the amount retained and the methods of measuring retention.

b. The relationship between the degree of acquisition and the amount retained for varying lengths of time.

c. The relationship between the degree of intelligence and the amount retained; also age and sex differences. There is also the problem of individual differences in retention. Does the group become more or less homogeneous with lapse of time? Although a great deal is known about individual differences in acquisition, little is known about individual differences in retention.

d. The relationship between teaching objectives (other than those mentioned) and the amount retained for varying periods of time.

e. The effect upon retention of interpolated activities—the study of interference and reminiscence—the influence of the amount and character of activity following acquisition.

f. The relationship between the amount retained and methods of teaching.

g. The relationship between the amount retained and the study habits of pupils. This problem could be studied in relation to types of learners and learning.

h. The relationship between the amount retained and the frequency with which classes are held; also the relationship between the amount retained and the length of the course as expressed in weeks or months. An attempt could be made to check laboratory studies dealing with the effect of distributed practice.

6. *Determining the pupil's ability to transfer his learning to other situations, both similar and different.* Although ability to apply knowledge within a particular field could be measured by tests, the effectiveness of learning is determined by the ability to apply knowledge in other situations. An index of good learning would take into account at least three measures—how much is acquired, how much is retained, and how much of that which is both acquired and retained can be applied. Transfer of training is essentially a process of application.

Almost all of these problems have been investigated with varying degrees of success in the psychological laboratory, but the results in their setting have only indirect value for the student of education seeking a practical understanding of the learning process. In the psychological laboratory, by means of artificial materials and laboratory techniques used in a controlled environment, one may describe rather accurately the ways in which learning proceeds and isolate the factors which influence it. In the typical school, although it may never be possible to attain the control and precision of the laboratory, dependable results may be obtained by the careful formulation of objectives for school subjects and the construction of tests which will measure their attainment. Where experimental schools are used for research, it is probable that one would run as little risk of error as the psychologist in his laboratory. Coöperation is needed between educators and psychologists. Educators can coöperate by furnishing practical advice on problems involving objectives, teaching procedures, and learning materials, and by offering their schools for experimental research. Psychologists can coöperate by furnishing technical skill in adapting techniques of the laboratory to the study of schoolroom learning.

AREAS OF HUMAN ACTIVITY

O. I. FREDERICK
University of Mississippi
and
LUCILE J. FARQUEAR
University, Mississippi

A group working in the Curriculum Laboratory at the University of Mississippi during the Summer Session 1936 became interested in discovering what contributions the field of research might make toward Mississippi's program for improvement of instruction. As a part of this general program, a research study relative to the major areas of human activity was made by one of the committees responsible for this work, a report of which follows.[1] Believing that research and educational philosophy should go hand in hand, the report begins with a statement of the educational philosophy which guided the work.

What is education? What is its ultimate aim? Education is a process of self-realization through learning to understand and participate in the activities comprising efficient living in the physical and social environment. This involves the development and use of (1) desirable habits and skills, (2) special interests and aptitudes, (3) creative and recreational expression, (4) an understanding of the past and present physical and social environments, (5) desirable attitudes and appreciations, and (6) coöperative participation in effective living with others. The part of the school is to direct this process. In this definition you will notice that integration of the individual—self-realization—is achieved through individual initiative and social participation. Not only is self-realization achieved largely through social participation, but social progress is achieved through self-realization of the greatest possible number of individuals. This idea of education is neither unique nor original, but it is important for sane curriculum thinking.

What activities comprise efficient living? To answer this, we must make a study of the individual's activities as carried on in organized society. What does one actually do? What man actually does today is really an outgrowth of what man has always done. The inventions that we think of as being so modern had their origins long ago. Our institutions and our knowledge are the result of social development under relatively favorable physical conditions. So, we are greatly influenced by

[1] Lucile J. Farquear and L. L. Byers under the general direction and with the assistance of O. I. Frederick.

our social and physical heritage. Through the intelligent use of this heritage we are able to carry on the same basic activities today as did the people in ancient times, but we carry on these activities in a vastly different way. Their activities were simple because their intellectual capital was meager. Thanks to our rich heritage, our groups of activities—our areas of living—are complex and more nearly adequate.

Our activities are inadequately performed. This is true because adequate performance has to be learned. The responsibility of the school is to see that more nearly adequate performance *is* learned. The function of the school is so to enrich the life of each individual, to help him acquire so much of this rich heritage from the past that each can perform the activities of our highly organized society as efficiently as possible. But our social heritage has become a vast accumulated capital. Today no human mind can possess all knowledge and experience. The school must choose wisely and make available to the child only the most useful, the most essential things from the social heritage.

How choose the most essential things? This brings us back to our aim of education. Education is to direct individuals in learning the activities comprising efficient living in the physical and social environment. The essential things should be, then, those things that are essential for the individual's success in carrying on the activities of efficient living both as an individual and as a member of society. In order to choose these essential things, we must first decide upon the desirable activities performed by people in organized society. We are back to our question, What does man do? Obviously, what man does includes thinking and feeling as well as acting. What are his major groups of activities, his areas of living?

Many different answers have been given to this question; many different classifications of life activities have been made. The first task of the committee was to make an analysis of various classifications of human activities.

Classifications of human activities. For the purpose of an analysis, it was desirable to find as many different types of classifications as possible. A strange assortment of sources was consequently used to answer certain questions. What did the outstanding writers of Ideal Commonwealths believe to be the major areas of activity? What do intelligent American club women regard as the important areas of living? What do other states revising their curriculum programs employ as the major areas of human activity? What do leading sociologists, anthropologists, economists, and

educators consider to be the major areas? Thirty-eight classifications, many of them based on research findings, were found and used in this investigation to secure answers to such questions.[2]

Considerable variation was found in the bases employed for determining the major life activities. Some writers based their classifications upon social problems, some upon needs, others upon social institutions; some based their classifications upon what really *is*, others upon what they believed *should be;* a few built their classifications primarily about the individual, while the majority built theirs about society.

Some areas of human activity or phases of life were found in practically every one of the 38 classifications, while other areas were found but once. A list was made of the 77 different items found in these 38 classifications. It was found that eight areas of human activity stood out as being included in the great majority of classifications. The two activities ranking ninth and tenth seemed to make a logical combination and were combined to form a ninth area comparable in frequency to the other eight.

The committee realized that a certain area's inclusion in most of the classifications did not *necessarily* guarantee its deserving special recognition any more than the exclusion of a certain area from most of the classifications meant that it had no importance. However, careful thought concerning these nine outstanding areas led to the conclusion that they were basal, or fundamental, drives of man. Evidently, the reason they were common to practically every classification was because they represent *universal types of activity*, activities in which men have always been engaged and probably always will be engaged. The nine areas of human activity which emerged because of highest frequency of mention in the 38 classifications, were reworded as "doing" activities—the basic things which people actually do. What people do includes thinking and feeling as well as acting. Moreover, the actions of people are influenced greatly by what they think and feel and so thought and feeling are included indirectly also—included in the way in which they really function effectively, that is through action. Careful study of the 67 remaining items mentioned in the classifications indicated that they were less comprehensive

[2] See the bibliography at the end of the article. Some of these classifications were titles of chapters or parts of books or were important topics discussed while other classifications were specifically listed as objectives, phases of living, institutions, aspects of life, or areas of human activity.

For a complete digest of these 38 classifications see *Areas of Human Activity and Problems of Life* which can be secured from the Mississippi State Department of Education, Jackson, Mississippi, for 15 cents.

in nature than these nine areas of human activity. They were logically and easily placed under the nine major areas listed below. The frequency under this arrangement was then found to be as follows:

1. Protecting Life and Health..... 36
   Life and health—33; safety—2; biological heritage—1.

2. Making a Living..... 50
   Vocation-economic — 27; consumption — 6; production — 5; property—5; labor groups—2; men and machines—2; unemployment—1; farm relief—1; standard of living—1.

3. Making a Home..... 43
   Family-home—28; childhood and youth—3; sex—3; position of women—2; housing—2; food—2; clothing—1; practical activities—1; personal services—1.

4. Expressing Religious Impulses..... 30
   Religion-ethics—23; integrated philosophy—3; morals—3; prevailing ideals—1.

5. Expressing Aesthetic Impulses..... 25
   Aesthetics-art—22; culture—1; mythology—1; charm and good manners—1.

6. Securing Education..... 42
   Education—20; integration of individual—3; mental efficiency—3; cinema—2; intellectual vision—2; psychology—2; the press—2; fundamental processes—1; radio—1; biographies—1; how to study—1; reflective thinking and capacity for work—1; popular beliefs—1; folkways—1; mores—1.

7. Coöperating in Social and Civic Action..... 76
   Socio-civic—34; social intercommunication—6; international relations—6; humanity-people—6; social security—3; crime and punishment—3; war—3; freedom—3; social welfare—2; taxation—2; the community—2; justice—1; prohibition—1; population—1; action and conflict—1; our constitution—1; legislation—1.

8. Engaging in Recreational Activities..... 32
   Recreation-leisure—31; social contacts—1.

9. Improving Material Conditions..... 51
   Science—10; invention-exploration—9; communication—6; transportation—6; conservation—4; animal world—4; geography—3; buildings—2; material conditions—2; physical heritage—1; climate—1; time—1; power—1; steel—1.

After thus re-wording the nine areas of human living to make them express the things that people actually do, it seemed necessary to analyze these major areas further to make certain that all vital problems of actual living were being cared for by them. For this purpose 44 recent books, bulletins, and courses of study dealing with problems and trends of contemporary life were examined, and the problems treated by them were listed under the areas to which they belonged. As a further check, recent textbooks in various fields were examined to see if the problems they considered important had been utilized. In this fashion 349 problems of human living[3] were assembled and it was found that all these problems could easily be placed under the nine major areas.

These nine areas of human activity were checked also against the following criteria which they met well:

1. That the areas should have an underlying theme or principle that would prevent the inclusion of diverse, discordant items that have characterized so many classifications of life areas.

2. That they should be in accord with a sound, basic philosophy of education.

3. That they should provide for a balanced emphasis upon the individual and society.

4. That they should make provision for training the child to live successfully while a child as well as training him for successful adult life.

5. That they should include not only people's actions but also the thoughts and feelings underlying their actions.

6. That they should represent broad areas of human activity which have existed throughout the ages, and which, in consequence, would be significant for the future as well as for the present. The activities under these areas vary somewhat from age to age. This makes possible an emphasis on what should be, and so becomes practical for a progressively changing social environment.

7. That they should call into use the vital aspects of various fields of knowledge, both past and present, not giving undue emphasis to any one field.

8. That they should include all vital aspects of human activity. Individuals should be so directed that they will participate in the various areas of human activity, not neglecting any nor letting one activity interfere

[3] These problems are listed in *Areas of Human Activity and Problems of Life*, Mississippi State Department of Education, Jackson, Mississippi, pp. 42. Price: 15 cents.

with successful participation in other activities. For instance, an individual should not be so concerned with activities involved in Getting a Living that he would neglect the activities desirable in Making a Home or in Expressing Aesthetic Impulses.

9. That the areas of human activity should be comprehensive enough to cover the entire scope of education, including the development of skills, habits, understandings, appreciations, and attitudes needed in efficient and enjoyable living both as an individual and as a member of society.

Concluding Statements. Probably the most pressing, as well as most puzzling, problem confronting present-day education is that of changing our out-grown, traditional curriculum to fit a progressively changing society. Educators agree that curriculum revision is necessary; they do not agree upon the method of revision. Regardless of the ultimate method used, however, the starting point must be the same—a sound philosophy of education.

If the definition of education stated in the opening paragraphs of this article is acceptable, then it follows that the revised curriculum should consist of those experiences which would assist the individual to achieve self-realization by learning to perform as adequately as possible, the activities comprising efficient living in the physical and social environment. Then any experience—any curriculum content—which falls short of imparting knowledge, attitudes, appreciations, skills, or habits necessary to efficient and enjoyable civilized living must de discarded. What basis should be used for deciding upon the things that are essential for the individual's success in carrying on these activities? The basis might well be the fundamental desirable things which man actually does, and which reveal his thoughts, feelings, and aspirations, together with the problems growing out of life in the physical and social environment. The purpose of this article has been to present a workable and satisfactory list of areas of human living, a list based not upon any single individual's personal bias or personal philosophy, but representing a composite of thirty-eight varied and representative classifications built upon both philosophic study and research. The fact that this composite classification of areas of living meets the demands of the nine carefully worked-out criteria stated previously frees it, we hope, from most of the objections that have been levelled against other attempts to classify areas of human activity.

In each of these nine areas of human activity, there are many vital problems and activities of life which can be made the basic content of the curriculum whether that curriculum is organized primarily in terms of

subject fields or largely on the basis of an integrated program cutting across subject fields to a considerable extent and in some instances organized directly around the problems of life themselves.

Therefore, it is believed that this classification of areas of human activity, in either case, furnishes a good starting point for developing a dynamic curriculum which will be sufficiently comprehensive and flexible to meet the needs of the present and of the changing future.

Bibliography for Classifications of Human Activity

1. Arkansas. *The Arkansas Coöperative Program to Improve Instruction,* Bulletin No. 1, Little Rock: State Department of Education, 1933.
2. Bacon, Sir Francis. *Essays: Civil and Moral,* and the *New Atlantis,* New York: P. F. Collier and Son, 1909.
3. Bobbitt, F. *The Curriculum,* Boston: Houghton Mifflin Co., 1918.
4. Bobbitt, F. *How to Make a Curriculum,* (Boston: Houghton Mifflin Co., 1924), pp. 8-9.
5. Bobbitt, Franklin. *Curriculum Investigations,* (Chicago: The University of Chicago Press, 1926), pp. 7-40.
6. Bonser, F. G. *The Elementary School Curriculum,* (New York: The Macmillan Co., 1921), Chapter 3.
7. Chapman, J. C., and Counts, G. S. *Principles of Education,* (Boston: Houghton Mifflin Co., 1924), p. 194.
8. Charters, W. W. "The Stephens College Program for the Education of Women," *News Bulletin, Society for the Study of Curriculum,* V (September, 1934), pp. 2-4.
9. Counts, G. S. *The Social Foundations of Education,* New York: Charles Scribner's Sons, 1934.
10. Courtis, Stuart A. "Reading Between the Lines," *Twenty-sixth Yearbook of the National Society for the Study of Education,* Part II, (Bloomington, Illinois: Public School Publishing Co., 1926), p. 97.
11. Department of Superintendence. *Tenth Yearbook,* (Washington: National Education Association, 1932), pp. 17-27; 183-190.
12. Finney, Ross L. *A Sociological Philosophy of Education,* (New York: The Macmillan Co., 1933), pp. 86-87; 89.
13. Glover, Katherine, and Dewey, Evelyn. *Children of the New Day,* (New York: Appleton-Century Co., 1934), pp. 211-256.
14. Inglis, Alexander. *Principles of Secondary Education,* (Boston: Houghton Mifflin Co., 1918), p. 368.

15. *The Journal of the American Association of University Women,* Washington, D. C. A.A.U.W. Study Guides listed on the inside of back cover.

16. Lester, Orrin C. "What Is Wrong with Education," *American Educational Digest,* XLVII (January, 1928), pp. 205 ff.

17. Lynd, R. S., and Lynd, Helen M. *Middletown,* New York: Harcourt, Brace and Co., 1929.

18. Missouri. *Preliminary Plans for Curriculum Revision,* Columbia: State Department of Education, 1936.

19. More, Sir Thomas. *Utopia,* E. P. Dutton and Company.

20. Peters, Charles C. *Foundations of Educational Sociology,* (New York: The Macmillan Co., 1930), p. 320.

21. New Jersey, *A Manual for Secondary Schools,* (Trenton: State Department of Public Instruction, 1932), pp. 8-10.

22. Plato. *The Republic,* New York: Charles Scribner's Sons, 1928.

23. President's Research Committee, *Recent Social Trends in the United States,* New York: McGraw-Hill Book Co., 1935.

24. United States Bureau of Education, Bulletin No. 35, 1918, pp. 11-15.

25. *Research Bulletin* of the National Education Association, XII (November, 1934), pp. 249-284.

26. Snedden, David. "Planning Curriculum Research," *School and Society,* XXII (September 5, 1925), p. 289.

27. The Society for Curriculum Study. *Building America,* New York, 1935-36, 1936-37.

28. Spenser, Herbert. *Essays on Education,* Essay 1, New York: Appleton-Century Co., 1914.

29. Stout, Dean. *The Mathematics Teacher,* XXVII (December, 1934).

30. Texas Curriculum News Bulletin, *The Texas Curriculum Revision Movement,* Austin: State Department of Education, 1936.

31. Thorndike, Edward L. "The Goal of Social Effort: A Proposed Bill of Specifications for a Good Life for the Human Species," *The Journal of the American Association of University Women,* XXIX (September, 1934), pp. 199-200.

32. Virginia. *Tentative Course of Study for the Core Curriculum of the Virginia Schools,* Richmond: State Board of Education, 1934.

33. Webb and others. *High School Curriculum Reorganization,* (Ann Arbor, Michigan: The North Central Association of Colleges and Secondary Schools, 1933), p. 13.

34. Wissler, Clarke. *Man and Culture,* (New York: Thomas Y. Crowell Co., 1923), p. 74.

TWO METHODS OF TEACHING HIGH SCHOOL ALGEBRA: A CRITICISM

CARLETON WASHBURNE
Superintendent of Schools, Winnetka, Illinois

RICHARD DRAKE, in the September, 1935, issue of this Journal, reports an interesting experiment comparing two methods of teaching high school algebra—an "individual method" and an "individual-group method." The results, however, are not so interesting because the technique used in the "individual method," is such that no one who has seriously concerned himself with individual work would think of advocating it. His "individual-group" method on the other hand is probably a rather good sample of sane group instruction. Practically his experiment is a comparison between reasonably good teaching and definite assignments, on the one hand, and, on the other hand, almost no teaching and no assignments. Unfortunately he does not make this issue clear and confuses it by calling the latter the "individual method."

For both methods Drake used a textbook adapted to what Drake calls the "individual-group" plan—i.e., a text which requires, like most texts, a considerable amount of elucidation by the teacher. Drake's class that was taught by the group method (it is a bit confusing and cumbersome to keep calling it, as he does, the "individual-group" method) used the text appropriately, i.e., the teacher introduced each topic to the entire group, using the first part of every period to do some real teaching in connection with the text. The youngsters on the "individual method," however, simply plunged into the book to work things out by themselves. While the author of the text claims that it is self-instructive, even a casual examination of it by a teacher experienced in individual work, leads to the immediate conclusion that only the unusually bright and diligent child could possibly learn from it without considerable elucidation by the teacher. True, like the group method students, those taught by the "individual method" got some remedial help from the teacher, if after taking the practice test at the end of a week's unit they seemed to need such remedial help. Except for this, however, they apparently received little or no teaching.

As if this were not a sufficient handicap, "each student did only as many problems as he felt to be necessary in order to understand the work"! Children brand new to the study of algebra, freshmen in high school, were expected to decide for themselves, seemingly unaided, how much practice they needed on each step of the work. It would be a re-

markable class that would err on the side of too much drill and of overwork.

The "group method" children, on the other hand, had daily systematic assignments by an experienced teacher.

The problem therefore resolves itself to this: "Will children, without teaching, using an ordinary textbook, and allowed to do as they please about practice and drill exercises, learn algebra as well as those who get, in addition to the textbook, daily instruction and systematic assignments from the teacher?" Any experienced teacher could predict the results that Drake got—although the "individual method" children really did better than one would expect under the circumstances.

It is, I believe, significant that Drake does not mention any other experiments that have been done along this line, and that not one of his footnote references is to any book or article on individual instruction. One would suppose him to be unaware that any work had been done in this field. The "individual method" which he uses, dates back, except for his use of practice tests, to the days of Preston Search and the Pueblo Plan forty-five years ago—and was even more hit or miss than the Pueblo Plan, which at least decided how much practice the child should do. All of Frederic Burk's work on the need for self-instructive teaching material, done twenty years ago, is ignored. All techinques of assignment worked out in schools that use individual method are forgotten.

Ten years ago and more the National Society for the Study of Education published a Yearbook on "Adapting Schools to Individual Differences" (Twenty-fourth Yearbook, Part II). In Section V of that Yearbook a definite program of individualization is given, showing the necessity of self-instructive text material, especially prepared for individual work, or of an assignment booklet giving the necessary teacher explanations to accompany a regular text. A definite plan of assignments for the children is suggested, and a system of diagnostic testing with necessary remedial work. In that same Yearbook are descriptions of a variety of experiments with individual work. None of them simply turn children loose on a textbook without instruction and without assignments.

Interestingly enough, a textbook in individualized algebra has been prepared based on work in the very school where Mr. Drake conducted his experiment. Dr. C. N. Stokes, now at Temple University, was formerly head of the mathematics department at the University of Minnesota High School, and has reported some interesting experiments on the results of

individual teaching of algebra versus group method with materials which he especially prepared for the individual work.[1]

Any sensible method of individualized work presupposes that if the child is to get along with a minimum of help from the teacher, text material must be prepared with this in mind or must be supplemented by self-instructive explanations—lucid, childlike explanations and worked out examples, instead of the over-condensed explanations found in the ordinary text and in the text used by Drake. You can't just take away the teacher, and put nothing in his place. Furthermore any informed teacher using individual instruction, plans the child's assignments with considerable care. This is usually done at regular intervals in consultation with the child and with consideration of the child's ability and stage of development.

The most important element of individualization, however, has not yet been touched upon. It is not brought out in the 24th Yearbook of the National Society for the Study of Education, but does come into the 29th. That element is the question of the child's readiness—grade-placement, some call it. The primary object of individual instruction is to enable a child to wait until he has the necessary maturity and foundations to learn any given topic. To take a group of children who happen to be put into an algebra class because they have just come in from the eighth grade and plunge them all at once into the same material, regardless of the difference in their mental ages and regardless of their mathematical foundations is the antithesis of individual instruction.

A real comparison between individual method, as it is understood by those who have made any study of it, and group method, would involve first of all the careful testing of every child in the individual method group as to his mental age and as to his mastery of the prerequisite foundations and mathematical abilities and concepts. Then no child would begin his algebra until he had reached the necessary mental age and mastered the necessary foundations—for some children this might be in their freshman year, for some in their sophomore, junior, or senior year. For a few it would perhaps never occur. Once started on their algebra, the individual group would use a self-instructive text, with explanations and worked out examples which had been tried out on children time and again and found to be effective with the minimum of help from the teacher. They would have diagnostic tests at frequent intervals and

[1] Stokes, C. N., and Sanford, Vera. *First Course in Algebra.* New York: Henry Holt & Company, 1935.

these would be keyed to the necessary remedial work. They would have systematic assignments made by the teacher at regular intervals and suited to their own individual needs and ability. The work of such a group, so instructed, might be compared with such a "group method" class, as Mr. Drake describes. I wonder, however, whether even Mr. Drake would question the prediction that the outcome would be far different from that which he got by setting up a man of straw and calling it "individual method."

SIXTH GRADE HEALTH AWARENESS IN MASSACHUSETTS

FREDRIKA MOORE
AND
ANGELINE HAMBLEN
Massachusetts Department of Public Health

INTRODUCTION

FOR fifteen years or so, teachers have been trying to interest their pupils in spinach, early bed hours, clean hands and such other things as have been decreed to be good for young bodies and minds by those whose wisdom should enable them to know. The lure of spinach, et al, has not been such as to cause them to be snapped up avidly either literally or figuratively by the young; so hard pressed instructors devised a barrage of health posters, health books, health games and competitions under cover of which they hoped that the health habits would slip up on the children unawares. These tactics not proving entirely successful they are gradually being abandoned for what appears to be a more scientific approach.

This new approach, backed by psychology and pedagogy, uses as its ammunition such terms as,—"learning by doing," "putting the pupils into actual life situations," "training judgment in health matters." Whether it will prove a more successful approach than the earlier one only time will tell. And when that time comes perhaps some clever person will have devised a way by which the results of the attack can be satisfactorily tested. At present there is no such test. After all the real results cannot be ascertained until the children have matured and are living lives unsupervised by parents and teachers, when their soundness of health or lack of it and their manner of living will tell the story, could it but be read, of how much or how little our efforts have availed.

In the meanwhile we must evaluate as best we may the work being done even though we get thereby merely trends, suggestions and ideas instead of definite statistical evidence, otherwise we shall drift entirely without guidance in our health teaching. Hence, this article is offered. It answers no questions finally, perhaps it raises more questions than it answers. It presents the results of a health awareness test given to sixth grade children in Massachusetts and discusses the results. Since Massachusetts is probably an average state as concerns its school health program perhaps these results will prove suggestive to others.

CONDITIONS UNDER WHICH THE TEST WAS GIVEN

In Massachusetts all the communities have the benefit of school medical and nursing service and the law requires a health examination of every child once a year, and to a certain extent sets the standard of the examination by requiring a standard physical record card to be filled out. The nurses "follow up" in the homes.

The majority of the teachers carry on morning inspection, and health instruction is universal, but it varies from the casual use of health readers to well organized programs. The superintendents of schools are, as a whole, convinced of the value of school health programs and give them support.

During May and June of 1934 the abbreviated form of the American Child Health Association "Test of Health Awareness" was given to 2033 sixth-grade children in 46 schools in 21 places. (For a description of the complete test see Health Education Tests, School Health Research, Monographs No. 1, American Child Health Association, distributed by the American Public Health Association, 50 W. 50th Street, New York City). The group was made as representative as possible, being composed of children from different parts of the State, from communities of different size, children of different social levels, children with organized health instruction and those where the instruction is more casual.

The test itself is in three parts, the first part consisting of four short stories in which the children are supposed to underline statements concerning things that are good for health and to cross out those that are bad for health. This is timed for fifteen minutes. The second part, matching, is timed for seven minutes, and the third part, true false, timed for eight minutes.

In giving the test the explicit directions which came with it were followed. Except in one instance the tests were given by the same person. They were corrected according to the key furnished by the American Child Health Association. The teachers were not informed ahead of time that the test was to be given.

Of the 2033 children, 53 percent were from communities over 25,000, 30 percent from places 5,000-25,000, and 17 percent from places under 5,000. This approximates the percentage of distribution of school children in the State.

Intelligence tests were not made. The children were taken by classrooms unselected as far as mentality went, hence there is a scattering of mentally subnormal of about 1½ percent in the group tested.

Sixty-one percent of the children were of foreign born or mixed parentage. This corresponds to the latest figures, now five years old, of the parentage of children below fifteen in the Massachusetts schools which showed the percentage then to be 58. The main nationalities represented where a language other than English was spoken in the home were Italian, Portuguese, Scandinavian, French Canadian, and Polish.

RESULTS

TABLE I

COMPARISON OF THE RESULTS IN THE CITIES IN MASSACHUSETTS, NEW YORK CITY, AND TEN CITY SCHOOLS THROUGHOUT THE UNITED STATES

Percent of Cases Making *Less* than Score at Left

Score	Massachusetts Cities[1]	Nation-wide Survey[2]	New York City[3]
129	....	100.0	....
125	....	99.9	....
121	100.0	99.9	....
117	99.9	99.7	....
113	99.9	99.3	....
109	99.7	97.9	100.0
105	99.5	95.9	99.5
101	99.2	92.9	99.0
97	98.8	87.8	98.3
93	97.3	83.0	96.3
89	94.8	77.3	92.8
85	92.0	69.9	88.7
81	88.3	63.1	81.1
77	83.4	55.3	74.5
73	77.0	49.3	68.1
69	70.5	42.5	61.2
65	63.0	34.9	52.8
61	54.7	27.2	44.8
57	46.5	22.0	36.2
53	37.2	17.3	29.3
49	29.2	13.0	21.9
45	22.2	10.8	16.3
41	15.2	7.8	10.8
37	9.7	5.0	6.7
33	6.8	2.8	4.2
29	4.4	1.3	1.9
25	2.4	0.5	1.3
21	.9	0.2	0.5
17	.5	0.1	0.1
13	.1	0.1	.0
9	.0	.0	....

133 the highest possible score

[1] Based on 1081 cases in 21 schools in 6 communities.
[2] Based on 938 cases in 18 city schools.
[3] Based on 1446 cases in 10 schools.

TABLE Ia

COMPARISON OF THE RESULTS IN MASSACHUSETTS BY SIZE OF COMMUNITY

Percent of Cases Making *Less* than Score at Left

Score	Cities over 25,000	Cities and Towns 5,000 to 25,000	Towns under 5,000
121	100.0	....	....
117	99.9	....	....
113	99.9	....	....
109	99.7	100.0	100.0
105	99.5	99.5	99.3
101	99.2	98.5	99.3
97	98.8	96.7	98.0
93	97.3	93.5	96.5
89	94.8	91.0	95.0
85	92.0	86.8	91.8
81	88.3	81.3	85.6
77	83.4	72.0	81.0
73	77.0	65.5	73.9
69	70.5	58.0	67.0
65	63.0	49.8	57.5
61	54.7	42.3	47.0
57	46.5	33.8	39.8
53	37.2	25.5	31.5
49	29.2	18.1	23.5
45	22.2	12.8	15.8
41	15.2	9.3	10.9
37	9.7	6.8	6.9
33	6.8	4.1	4.3
29	4.4	2.7	3.1
25	2.4	1.3	.6
21	.9	.0	.3
17	.5	....	.3
13	.1	....	.0
9	.0	....	....

133 the highest possible score.

Based on 2033 cases in 46 schools in 21 communities

TABLE II

PERCENTAGE DISTRIBUTION OF MARKS IN QUARTERLY DIVISION OF GRADES, BY SIZE OF COMMUNITY (See Chart)

	Cities over 25,000	Cities and Towns 5,000 to 25,000	Towns under 5,000
Highest quarter grades 0-48.....	21	33	22
Second quarter grades 49-60.....	24	25	31
Third quarter grades 61-73.....	26	24	23
Lowest quarter grades 74-118.....	29	18	24

TABLE III

COMPARISON OF THE RESULTS BY AGE AND SEX

	Boys			Girls		
	11 yrs.	12 yrs.	13 yrs.	11 yrs.	12 yrs.	13 yrs.
Number included	364	356	193	395	334	140
Highest score	118	107	90	108	109	105
Lower quartile	51	47	42	57	50	44
Upper quartile	75	72	67	79	76	64
Median	62	59	54	67	62	55

TABLE IV

COMPARISON OF THE RESULTS BY FORM OF QUESTION

	Story	Matching	True False
Highest possible	72	21	40
Actual highest	66	21*	39**
Lower quartile	17	7	22
Upper quartile	32	13	31
Median	24	10	27

* 12 children had perfect scores.
** 3 children had this score.

SUBJECT MATTER OF QUESTIONS

The questions were divided under fourteen headings. A representative sample of 541 books were examined with the following results. It should be borne in mind that there were not the same number of questions on each subject.

TABLE V

Subject Matter of Questions	No. of Questions	Percent of Questions answered correctly
Food habits and foods	16	60
Sunshine and fresh air	3	50
Rest and sleep	3	29
Exercise	1	68
Body cleanliness	6	48
Hygiene of special organs	9	65
Sanitation and preventive measures	37	44
Clothing	4	61
Safety and first aid	4	63
Mental hygiene	3	52
Sex education	1	45
Alcohol, tobacco and drugs	1	67
Physiology and anatomy	7	39
Posture	2	48
Total	97	

TYPE OF INSTRUCTION

Classes were chosen for comparison where the social status was similar but where the teaching varied.

TABLE VI

	Class 1-A	Class 2-A
Highest score	99	93
Lowest score	25	25
Lower quartile	55	44
Upper quartile	79	70
Median	66	52
Average	66.5	56.9

These children, 80 percent of foreign parentage, were in different rooms in the same building. All had morning inspection. Health readers were used for all, but Group I-A had regularly 15 minutes a day of health instruction, the other class no health work beyond morning inspection and occasional casual reading.

	Class 1-B	Class 2-B
Highest score	104	84
Lowest score	49	38
Lower quartile	67	56
Upper quartile	93	72
Median	76	61
Average	79.7	61.7

These were classes in the same school of similar home background. Class 1-B had a teacher interested in a health program. Class 2-B's teacher was indifferent.

	Class 1-C	Class 2-C
Highest score	94	107
Lowest score	34	27
Lower quartile	51	39
Upper quartile	67	79
Median	58	57
Average	60.5	60.5

These two classes were in different towns. Both were composed of Italians and Portuguese. Both were housed in sanitary buildings. Units of activity are used in teaching Class 1-C. Class 2-C has no inspection and uses no readers; its health instruction is casual.

	Class 1-D	Class 2-D
Highest score	95	97
Lowest score	36	28
Lower quartile	60	46
Upper quartile	76	73
Median	69	62
Average	67.3	60.9

These two classes were in different communities but were both composed of upper middle class American children. Class 1-D was in a town where there had been an organized health program over a period of years. There was no or very casual health teaching for Class 2-D.

	Class 1-E	Class 2-E
Highest score	97	83
Lowest score	27	25
Lower quartile	51	46
Upper quartile	76	69
Median	65	62
Average	63.5	58.5

Class 1-E had no morning inspection. Health readers were in use. The teacher was enthusiastic and was the first year out of teachers college. Class 2-E had morning inspection but no other health teaching. Both classes were composed of American children in semi-rural communities.

TABLE VII

Social Status and Race

	Class 2-F	Class 1-C
Highest score	101	94
Lowest score	48	34
Lower quartile	66	51
Upper quartile	83	67
Median	77	58
Average	75.7	60.5

These groups are from the same town. Class 1-C is composed of Italians and Portuguese, where for the most part English is not spoken at home. Class 2-F is a class of American children from comfortable middle class homes. Class 2-F has had morning inspection and uses health readers twice a week. There is an excellent activities program in Class 1-C.

	Class 1-E	Class 2-G
Highest score	97	95
Lowest score	27	34
Lower quartile	51	49
Upper quartile	76	78
Median	65	64
Average	63.5	62.2

These classes are in the same rural community. The type of teaching is the same in both schools. Class 1-E is 95 percent American; Class 2-G, 70 percent of foreign parentage.

	Class 1-H	Class 2-C
Highest score	98	107
Lowest score	26	27
Lower quartile	54	39
Upper quartile	83	79
Median	68	57
Average	62.6	60.5

Both classes are in rural communities. Neither have any health teaching that could be called such. Class 1-H is composed of Scandinavians; Class 2-C of Portuguese.

	Class 1-D	Class 2-I
Highest score	95	106
Lowest score	36	28
Lower quartile	60	53
Upper quartile	76	77
Median	69	65
Average	67.3	64.8

Both classes are in the same city and have been exposed to the same organized health teaching. Class 1-D is composed of American children of upper middle class. Class 2-I is composed of children of foreign parentage (Hebrews, Italians, Irish).

DISCUSSION

In going over the study two results catch the attention immediately (Tables I and II): Massachusetts sixth-grade children did not distinguish themselves in the test when compared with the children in the other two studies, and in Massachusetts the city children did far less well than the children in medium sized communities.

Any comment on Table I is based entirely on speculation as conditions and health programs in the cities outside of Massachusetts are not known. We know only that more Massachusetts children were tested than were tested in either of the other two programs and that the directions for giving the tests were followed carefully, as will be seen later. Race, interest of the teacher, and home environment are influential factors in health consciousness.

Whether the children tested were unequal in these factors or whether the determinating factor lies in the health instruction program is not known.

Within Massachusetts the difference of scores in favor of the medium-sized places is sufficiently marked to suggest that it is due to something more than chance. Nationality as a cause of difference can probably be eliminated since that factor was cared for by keeping the percentage of children of foreign born approximately equal in the different groups of communities. Home environment, on the other hand, may be a determining influence, as it is more favorable in communities of medium size than in the large cities where there are large groups of indigents, or small rural communities where struggle for maintenance is severe. There is no way of accurately determining this, but there is an impression that in the medium-sized places the general level of intelligence in foreign groups is higher and there are more effectively organized community health programs and greater interest in health problems among the teachers.

When results by age and sex are compared (Table III) it is found

that the highest score made, 118 out of a possible 133, was made by an eleven-year-old boy. Aside from this the girls did slightly better than the boys and the younger children better than the older ones. The age difference is probably due to the fact that no intelligence tests were given to eliminate the retarded children who naturally were older than the average in their grade. As the test was given in only one grade the fact that the girls generally did better than the boys might mean that boys in this particular age group have their interests focussed on other things and the tables might be turned if a different age group were considered.

The form of question undoubtedly influenced considerably the results (Table IV). The children were unfamiliar with the story form and had according to the scores the most difficulty with it. Most of the children had had experience with the true, false type in their tests in other subjects, so it was rather a surprise to find that they found the "matching" easiest. We question the accuracy of results obtained, when, in testing for a particular thing such as health awareness, an unfamiliar procedure is used with children of the sixth grade level. Though the procedure may be carefully explained too many other factors enter the picture, especially when the test is timed as this one was.

In attempting to evaluate the influence of the type of instruction upon health awareness (Tables under VI), five different groups were selected for study each group of two having similar backgrounds, but different types of teaching. A study of the results shows undoubtedly the favorable influence of the more interested teacher.

Some of the results under the comparison of social status and race (VII) are a bit puzzling. A comparison of Class 1-C and Class 2-F shows Class 1-C with a well-developed health program doing less well than Class 2-F with only a casual one. Is this difference due to the better home environment of Class 2-F or was the test unfair to the children in Class 1-C who use English less readily than those in Class 2-F. On the whole this group of figures indicates a difference in health awareness in favor of children of English speaking parents from comfortable homes.

SUMMARY

In our attempt to form some judgment of the results of health teaching in the public schools of Massachusetts we feel that:

1. Medium-sized towns did slightly better than rural communities and much better than cities.
2. Girls generally did better than boys.

3. The form in which the question was presented made some difference, the "story" type being most difficult.

4. Questions on food and food habits showed a fairly large percentage of correct answers, while a poor showing was made in questions on sanitation and preventive measures.

5. The child's knowledge of health habits is influenced by the home environment and by the type of instruction.

A test of this type is no criterion of the influence upon actual living affected by health instruction in the schools. It tests the ability of the children to indicate what they *know* about healthful living and to some extent it tests their judgment in health matters. The handicap, in taking a test of this kind, suffered by children from homes where little English is spoken must be taken into consideration when comparing their results with those of children from American homes.

However, while we are aware that too great reliance should not be put on a test of this kind, we feel that some valuable hints, at least, affecting health instruction may be found in this study.

It seems reasonable to suppose that the prevailing low scores indicate one of two things; either the test is not suited to this age group or that our present methods of health instruction are not as effective as might be wished. More tests and more studies made by others in different parts of the country are urgently needed if methods in health education are to be evolved which will place this important phase of school life on a high plane.

PREDICTING PERFORMANCE IN COLLEGE ENGLISH[1]

MAZIE EARLE WAGNER and EUNICE STRABEL
University of Buffalo

THE purpose of the present study is to determine what measures available at college entrance best predict subsequent performance in English. Our experimental group includes all students—661 men and women students—who entered the University of Buffalo during the years 1925 through 1929 except transfers from or to other colleges and those who "were failed out" during the first semester.

The following data were obtained for each pupil: a weighted average of all "academic" New York State Regents Examination grades; all subject Regents grades including, of course, those for English; the *school*[2] average grade for the four years of English, and the *school* English I grade; the American Council Psychological Examination for High School Graduates and College Freshmen sigma scores for the entire examination and for the five sub-tests, Completion, Artificial Language, Arithmetic, Analogies, and Opposites; the Iowa High School Content Examination sigma scores for the total and for the four sub-tests, English, Mathematics, Social Science, and Physical Science; rank in high school graduating class for all students from four large Buffalo high schools; sex; age at high school graduation; and number of high school units credit. Our criteria of college English success were grades in freshman English, in sophomore English, and an average of all English courses taken during the first two years of college attendance.

Table I shows prediction coefficients for our three criteria of English performance. By and large, of those measures studied, the weighted average of all academic New York State Regents Examination grades is the best predictive device. The Regents Latin III examination grade best foretells the college English average. The coefficients of correlation between our English criteria and (1) the English sub-test of the Iowa Content Examination, (2) the average of all *school* marks in English earned

[1] This study was made possible through a grant from the General Education Board. It is part of a larger study of prediction. See Wagner, M. E., "Prediction of College Performance," *The University of Buffalo Studies*, IX (1934), pp. 125-172 and 184-207.

[2] All New York State high school students are required to take final Regents Examinations issued by the University of the State of New York at the end of third and fourth year English, the second and subsequent years of all languages, the individual science, history, commercial, and art courses. These Regents Examinations are semi-objective in type, uniform for the entire State, and checked at Albany for uniformity of scoring. Class performance is in no wise included. The *school* grades result from class performance and teachers' examinations.

TABLE I

ZERO-ORDER CORRELATION COEFFICIENTS BETWEEN COLLEGE ENGLISH AND VARIOUS MEASURES

		MEAN 2-YR. COLLEGE ENGLISH		FRESHMAN ENGLISH		SOPHOMORE ENGLISH	
		No.	r	No.	r	No.	r
Total Regents Mean*	Boys	250	.57	250	.54	214	.37
	Girls	151	.65	151	.64	139	.59
	Total	401	.62	401	.61	353	.50
Total Regents Mean	Boys	390	.53	388	.49	376	.42
	Girls	217	.65	217	.63	212	.49
	Total	607	.60	605	.58	598	.48
Regents English IV	Boys	429	.47	430	.43	406	.36
	Girls	229	.58	229	.58	224	.42
	Total	658	.47	659	.53	630	.43
Rank in H. S. Class*	Boys	263	.47	264	.43	226	.34
	Girls	157	.60	157	.62	145	.56
	Total	420	.57	421	.54	371	.49
Iowa Content English	Boys	341	.52	346	.47	318	.40
	Girls	141	.58	140	.49	138	.42
	Total	482	.57	486	.50	456	.45
H. S. English Av.	Boys	334	.39	336	.40	320	.26
	Girls	184	.33	184	.48	180	.34
	Total	518	.52	520	.49	500	.39
American Council Education Opposites	Boys	422	.51	424	.44	404	.42
	Girls	230	.45	230	.47	225	.30
	Total	652	.49	654	.49	629	.38
Regents Latin III	Boys	245	.64	245	.40	237	.38
	Girls	157	.68	157	.52	154	.43
	Total	402	.68	402	.49	391	.43
Regents English III	Boys	425	.39	426	.41	**	
	Girls	232	.42	232	.48		
	Total	657	.45	658	.48		
H. S. English I	Boys	383	.39	385	.36		
	Girls	200	.33	199	.39		
	Total	583	.45	584	.41		
Regents English II	Boys	409	.32	411	.34		
	Girls	224	.44	224	.44		
	Total	633	.43	635	.44		
Total Iowa Content	Boys	340	.46	342	.45	325	.38
	Girls	141	.62	141	.58	138	.47
	Total	481	.50	483	.47	463	.39
Regents Eng. Literature	Boys	52	.07	52	.34	52	.17
	Girls	55	.60	54	.52	53	.41
	Total	107	.21	106	.44	105	.31
American Council Education Completion	Boys	422	.40	424	.40	404	.27
	Girls	230	.44	230	.49	225	.35
	Total	652	.37	654	.41	629	.28
American Council Education Total	Boys	416	.39	417	.38	400	.28
	Girls	229	.27	229	.48	224	.33
	Total	645	.35	646	.40	624	.28
Regents Eng. Grammar	Boys	266	.27	267	.34		
	Girls	163	.18	163	.29		
	Total	429	.30	430	.35		
American Council Education Artificial Language	Boys	422	.21				
	Girls	230	.44				
	Total	652	.30				
Age at H. S. Grad.	Boys	421	−.18				
	Girls	215	−.18				
	Total	636	−.23				
No. of H. S. Units	Boys	430	.09				
	Girls	232	.27				
	Total	662	.22				
American Council Education Analogies	Boys	358	.14				
	Girls	146	.15				
	Total	504	.12				

*Cases from only four large Buffalo high schools over a six year period. The rank in class as presented here cannot be compared with all *r's* presented in this table since the small high schools with their more variable student populations are not included.

**Inasmuch as time did not permit the calculation of all possible interrelations, the less likely ones have been omitted.

during high school attendance, and (3) the final Regents grade received in secondary school English, are also quite high. College English performance may be predicted almost equally well by a measure of general performance, of language achievement, or of previous success within the field of English itself.

Knowledge of vocabulary, such as shown by the responses to the Opposites portion of the American Council on Education Psychological Examination, provides a fair criterion for predicting success in future courses in English. The scores made by boys have slightly higher predictive value than those made by girls. Coefficients of correlation between boys' scores on this test and the marks earned in English are higher than for any other measure except the Regents average and the Iowa Content English sub-test.

A broad knowledge, such as is shown by a good score on the total Iowa Content Examination, is also significant in foretelling success in college English. The relationship between girls' scores on this test and English grades is higher than any other measure except the total Regents average. For the boys, this test is not so predictive of subsequent English performance.

The exact rank in the high school graduating class earned by each individual was available for students from four large Buffalo schools. This measure stands high in predictive value for such school populations. It is anticipated, however, that adding individuals from smaller schools will reduce the size of the relationship. This measure, therefore, is not recommended for general predictive use.

In general, the best predictive measure for any sophomore course is a freshman course in the same collegiate department.[3] The field of English is consistent with these findings. The relationship between these two courses is r.43 for boys, r.64 for girls, and r.59 for the total group. Freshman college English also provides the best prediction coefficient for the average of the other more advanced English courses taken by this student body.

THE COÖPERATIVE ENGLISH TEST

In an attempt to improve our "guessing system" with regard to English success, the Coöperative English Test was administered to the 1931 and 1932 entering freshmen classes. It will be noted from Table II that the total Regents mean and the total Coöperative English Test predicted

[3] Wagner, *Op. cit.*, p. 188 ff.

freshman English about equally well. For students within New York State, the Regents mean may be obtained with no investment of students' time, no test cost, and less clerical work than testing would necessitate. However, for non-New York State Secondary students, the Coöperative English Test would be very valuable.

The relationship between the total Coöperative English Examination and the sophomore college English grade is r.62. The best relationship obtained in the preceding section was r.59 between freshman and sophomore college English. Again our two best measures are about equal. For entering students, the Coöperative English Test would, of course, be superior. For students who have completed one year of college work, the freshman English grades can be obtained without any expenditure for tests and test correcting or additional investment of students' time.

THE NELSON-DENNY READING TEST

The 1931-32 entering freshman class was given the Nelson-Denny Reading Examination; subsequently many enrolled in freshman English. The correlation coefficients between grades in this course and (1) total

TABLE II

CORRELATION COEFFICIENTS BETWEEN COLLEGE ENGLISH COURSES AND COÖPERATIVE ENGLISH TEST, TOTAL AND SUB-TESTS

Combination of Scores and Grades		No. Cases	r
Coöperative Sub-Test Mechanics and			
English 101*	'31	189	.49
English 102*	'31	189	.34
English 101–2**	'31	186	.49
English 101–2	'32	148	.61
Combination Coöperative Sub-Tests Vocabulary and Literature and			
English 101–2	'31	189	.50
Coöperative Sub-Test Literature and			
English 101–2	'32	145	.40
Coöperative Sub-Test Vocabulary and			
English 101–2	'32	145	.51
Total Coöperative English Test and			
English 101–2	'31	189	.58
English 101–2	'32	149	.62
Combination Coöperative Sub-Tests Vocabulary and Literature and			
English 201–2**	'31	47	.49
Total Coöperative Test and English 201–2	'31	47	.62

*English 101–2 is the freshman course in this field; 101 is the first term and 102, the second.

**English 201–2 is the sophomore course in this field.

Reading Test scores was r.51, (2) the Paragraph Reading sub-test, r.33, and (3) the Vocabulary sub-test, r. 49. It will be remembered that the Opposites sub-test of the American Council Psychological Examination gave, especially for the boys, a fairly high prediction coefficient. The Vocabulary sub-test of the Nelson-Denny substantiates the statement that a good vocabulary is paramount in English course success. However, no

measure included in this test is as predictive as either Regents Latin III grades, Regents English IV, the average high school grade in English, the total Regents average, or the Coöperative English Test.

COMBINATIONS OF VARIOUS PREDICTING MEASURES

Investigation was made of the possibility of improving prediction of English success by the use of the multitple correlation technique (a statistical combination of variables). For the 189 cases for which complete data were at hand, the following relationships were obtained with grades in freshman college English:

Nelson-Denny total examination and age at high school graduation r.57
Regents English IV and age at school graduation..... r.59
Coöperative English total and age at high school completion..... r.61
Coöperative English and the Opposites sub-test of the American Council Examination r.62
Coöperative English total and Regents English IV..... r.69
Coöperative English total, Regents English IV, and age at high school completion r.69
Coöperative English total, Regents English IV, and total Nelson-Denny Reading Test r.69
Coöperative English total, Regents English IV, and the Opposites sub-test of the American Council Examination..... r.69

The composite of Coöperative English total Examination plus Regents English IV, statistically combined, gives the best multiple coefficient.[4] Adding to this combination either age at high school graduation, the total Nelson-Denny Reading Test, or the Opposites sub-test of the American Council Examination does not further increase the size of the correspondence.

COLLEGE SOPHOMORE TESTING PROGRAM RESULTS

In order somewhat to objectify our criteria of success in college English, the English and General Culture portions of the "Coöperative College Sophomore Testing Program results were substituted for average college English grades in the following investigation. These data were available for the 1931-32 entering freshman class.

[4] The regression equation to be used in predicting freshman English at this University is $x_1 = .04\ x_2 - .18\ x_3 + .58$, where $x_1 =$ freshman college English grades, $x_2 =$ Regents English IV marks, and $x_3 =$ Coöperative English total in standard scores ranging from 1 for the poorest to 10 for the best. The P.E. of the estimate of $x_1 = 0.4$. Example: if x_2 (Regents English IV) $= 90$, and x_3 (en 80th centile) $= 8$, then $x_1 = 3.6 + 1.44 + .58 = 5.6 \pm .4$ (where college grade of A = 6, B = 5, and so on).

TABLE III

COEFFICIENTS OF CORRELATION BETWEEN ENGLISH AND GENERAL CULTURE SUB-TESTS OF THE COÖPERATIVE TESTING BUREAU SOPHOMORE EXAMINATION AND MEASURES AVAILABLE AT HIGH SCHOOL GRADUATION

	Boys		Girls		Total	
	Number	r	Number	r	Number	r
Total Regents Mean and						
Total Sophomore English Test	69	.64	44	.57	113	.63
General Culture Sophomore Test	68	.51	43	.62	111	.55
Total English and General Culture	67	.63	42	.58	109	.62
Literature	68	.48	44	.45	112	.50
Vocabulary	71	.58	44	.41	115	.53
Regents English IV and						
Total English Sophomore Test	73	.63	47	.30	120	.57
General Culture	71	.43	45	.32	116	.40
High School English Mean and						
Total English Sophomore Test	57	.73	28	.56	85	.71
General Culture Sophomore Test	55	.49	28	.36	83	.41

The total Regents average is related to the total English sophomore test and to the combined total English and General Culture Examinations to about the same degree that it is related to average college English grades (See Table I). That is to say, the Regents average predicts college English performance about equally well whether the latter is measured by an objective short-item examination or by the usual college grading procedure.

Both mean *school* English and Regents English IV are more closely related to the sophomore college test performance than to mean college English grades. These higher relationships are probably due to an actual overlapping of the content of secondary school English class work and items on the objective test. To be certain, part of the relationship found between high school and college English is probably also due to actual repetition of course content on the two academic levels.

To summarize, college English performance may be predicted about equally well by a measure of secondary school English, a secondary school language, general high school performance, or the Coöperative English Test. Vocabulary seems especially important for the success of boys; general information, for girls. To improve upon any of the above best single predictive measures, a composite of fourth year high school English and Coöperative English Test performance may be used. It is quite immaterial whether class grades in college or an objective short-item test be employed as a criterion of college English success.

A METHOD FOR REDUCING FAILURES IN PLANE GEOMETRY

J. Landon Hamilton

Senior High School, Charleston, W. Va.

If failures are undesirable, then it is the duty of the teacher and administrator to prevent as many failures as is possible. A guidance program should not only lead a pupil into doing those things which he can best do, but should also guard him from attempting that which he either cannot do or is not as yet prepared to do.

Experiments and studies have shown that intelligence tests and certain prognostic tests such as "The Orleans Geometry Prognosis Test," used either separately or together are of real value in predetermining the success of pupils in geometry.

In recent years lack of funds has prevented many schools and teachers from using standardized tests of any kind. This has led to a need for some method both simple and inexpensive that can be used by any teacher in predicting the probable success of a student in geometry and in advising that pupil accordingly.

To meet this situation the author resorted to the use of grades made in 9th grade algebra and English. These two subjects were used because they are the subjects most closely related to geometry; algebra because it is mathematics and English because it requires reading with comprehension and the ability to express oneself logically. The results of this method proved to be better than was anticipated.

In the fall of 1934 a study was made of three classes in 10B or first semester plane geometry. These three classes totaled 87 pupils coming from five junior high schools.

TABLE I

Relation in 1934 of Grades in 9B and 9A Algebra and English to Grades in 10B Plane Geometry

Point-Average	No. of Pupils	Final grade in 10B geometry				
		A	B	C	D	F
4.00	4	4				
3.75	4	2	2			
3.50	12	4	5	2	1	
3.25	4		2	1	1	
3.00	13	1	5	5	2	
2.75	10		3	5	2	
2.50	9		1	4	3	1
2.25	7				6	1
2.00	13			1	6	6
1.75	6				1	5
1.50	4					4
1.25	1					1
1.00	1					1
	87 total					

TABLE II

RELATION IN 1935 OF GRADES IN 9B AND 9A ALGEBRA AND ENGLISH TO GRADES IN 10B PLANE GEOMETRY

Point-Average	No. of Pupils	Final grade in 10B geometr A	B	C	D	F
4.00	6	6				
3.75	4		3	1		
3.50	8	2	3	3		
3.25	0					
3.00	12		3	7	2	
2.75	14		2	12		
2.50	12	1	3		5	3
2.25	12			6	3	3
2.00	12	1	1	7	3	
1.75	2					2
1.50	5					5
1.25	1					1
1.00	0					
	88 total					

The final grades in 9B and 9A algebra and in 9B and 9A English were used to determine an average grade for each student. Since the grades were in terms of letters A, B, C, D, and F, each letter was given a numerical value of A-4, B-3, C-2, D-1, F-0. Thus a point-average (or P.A.) of 2.00 represents a C average, and a P.A. of 2.50 represents two C's and two B's or its equivalent which is half way between a C and a B average. (In case a percentage grade is used the average percent would be found.)

In column 1 of the accompanying Table I the various point-averages of the classes are listed from 4.00 down to 1.00. In column 2 is found the number of pupils having each point-average. Thus four pupils had a P.A. of 4.00 which is a straight A average, four pupils had a P.A. of 3.75 which represents three A's and one B, twelve pupils had a P.A. of 3.50, and so on down the table.

Now let us see what the results were at the end of the first semester of geometry. Of the twelve pupils having a P.A. below 2.00, in other words those pupils who were below average in their 9th grade algebra and English work, all but one failed 10B geometry. A study of the school records showed that the one exception was a borderline case receiving a conditional passing mark.

The thirteen pupils with a P.A. of 2.00 or a straight C average broke about even; seven passing and six failing. Of the remaining sixty-two only two failed. One of these had a P.A. of 2.25 and the other 2.50.

From these facts the following hypothesis and conclusions might be made. Given junior high school pupils similar to those in this particular situation, a similar standard of marking, and also given a teacher

in plane geometry with standards of marking similar to these demanded in the particular situation described in this article, then and then only are we justified in drawing the following conclusions:

1. Students with a P.A. below 2.00 in 9th grade English and algebra, (a student who is below average), either are not ready for or are not capable of passing plane geometry.

2. Students with a P.A. of 2.00 (presumably an average 9th grade student) stand about an even chance of passing plane geometry. They should be capable of passing, however, provided they realize their handicap and are willing to put forth the necessary extra effort in order to master the subject.

3. As a whole students with a P.A. above 2.00 are capable of mastering geometry and will pass without any undue difficulty.

It must be remembered that this table does not and cannot provide a norm for use by any teacher in any school system. To be of real value each teacher should work out his or her own table. This table merely indicates the results that may be expected by others who use the methods suggested to reduce failures in geometry.

In the fall of 1935 the foregoing table and conclusions were presented to three other classes beginning 10B geometry. A few students with a P.A. below 2.00 decided either they did not need geometry or that they would wait to take it later. Eight decided to go ahead and take it. Those with a P.A. of 2.00 consulted with their teacher and decided to put forth the extra time and effort needed to master the subject. The results are shown in Table II.

Once again all students with a P.A. above 2.50 passed and all those with a P.A. below 2.00, only eight this time, failed. The most encouraging result was that of the twelve having a P.A. of 2.00 every one passed. It is assumed that this improvement was at least partly due to the conferences at the beginning of the year which brought home the fact that they were at a disadvantage and that under ordinary circumstances they stood only about an even chance of passing.

In summing up it is found that the first year 19 out of 87, or 22 percent failed. In the following year 14 out of 88, or 16 percent failed. If all students with a P.A. below 2.00 had been omitted then the first year 8 out of 75, or 11 percent, would have failed and in the next year only 6 out of 80, or 7½ percent, would have failed.

These results would indicate that at least the above method is a step in the right direction in attempting to reduce failures in an elective subject such as plane geometry. Unfortunately, the study does not suggest the subjects which must be taken successfully in place of geometry.

A NOTE ON "THE LIFE-CAREER MOTIVE AND ITS EFFECT ON COLLEGE WORK"

M. V. MARSHALL
Franklin and Marshall College

IT has been called to my attention that some of the statistical computations, and conclusions therefrom, which were contained in my article published in the April, 1936, issue of the *Journal of Educational Research* were incorrect. The corrected figures are given in the tables below, which should be substituted for those in the original article. The statements and conclusions which need amending are those to the effect that the differences found were statistically reliable. In fact, none of the three differences was statistically reliable; the chances of a true difference have been given in the tables.

TABLE I

MARKS IN FRESHMAN YEAR

	Chose Before College	Chose Later
Number of men	36	55
Average mark in freshman year (M)	5.55	5.15
Standard deviation of marks	1.9	2.0
Standard error of mean	0.32	0.27
Difference in favor of men who chose before	0.40	
Standard error of difference	0.42	
Difference divided by its standard error	0.95	
Chances of a true difference greater than zero	83 in 100	

TABLE II

MARKS IN FRESHMAN, SOPHOMORE, AND JUNIOR YEARS

	Chose Before College	Chose Later
Number of men	36	55
Average mark in three years (M)	5.47	5.20
Standard deviation of marks	1.9	1.9
Standard error of mean	0.32	0.26
Difference in favor of men who chose before	0.27	
Standard error of difference	0.41	
Difference divided by its standard error	0.66	
Chances of a true difference greater than zero	75 in 100	

TABLE III

MARKS ON SUBJECTS RELATED TO VOCATIONS COMPARED WITH MARKS ON OTHER SUBJECTS

	Subjects Related to Vocations	Other Subjects
Number of men	91	91
Average of marks (M)	5.56	5.11
Standard deviation of marks	1.8	1.8
Standard error of mean	0.19	0.19
Difference in favor of related subjects	0.45	
Standard error of difference	0.27	
Difference divided by its standard error	1.67	
Chances of a true difference greater than zero	95 in 100	

EDITORIAL

A MEASURING TOOL TO AID INSTRUCTION

THE MEASUREMENT PROBLEM

THE elementary school meets the minds of the pupils at a period of growth concerned, in a particular way, with the development of a growing brain. The equipment of the mind for the understanding of experiences is quite largely accomplished by age fifteen. This is true not only for immediate conduct but also for the acquisition of knowledge that becomes a part of further experiencing ability. This is the basic equipment for the guidance of judgment in the further self-development for mature living.

The discovery of the growth of mind in relation to brain organization was made possible through the measurement of mental age growth. While the rate of mental age growth is uniform for each individual during the years to age fifteen, or thereabout, it develops for some minds more slowly and for others faster than the average growth. Mental age measurement standards for each chronological age are determined by "intelligence tests" as the average score made by many individuals having the same chronological age. The mental age of any individual, however, is the chronological age indicated by his score on the intelligence scale and may vary much from his own chronological age.

School instruction and training are recognized as closely related to mental age growth, but only rough adjustments are as yet determined for this relation. Such adjustments are now arrived at by the general experiences of the schools with courses of study material and with different methods of instruction. A common measuring scale with units applicable to both mental age and possible school attainment ages, can be satisfactorily developed only by extensive coöperation of the schools together with studies of the details of instructional needs and with methods of adapting the course of study material to mental age abilities in a way to secure the needed interest and effort of pupils.

TEST RELATIONS TO THE SCALE

The form for such a scale of reference provides for three relations of the usual objective tests when they are validated, not only to the course of study, but also to the instructional relations for each successive mental age growth of the pupils. The first relation is that with the advance in chronological age. There are evident reasons for beginning this advance with age seven and extending it up to age seventeen. The second relation is that for mental age (or for learning aptitude age as, perhaps, a better term to use in this relation). The average learning aptitude advances from that of grade two by one year intervals to grade eight or from age seven for beginning second grade to age fourteen at the end of grade eight. To measure the attainment of bright pupils the scale is extended through grade eleven at the end of age sixteen. The third relation gives the "percent reference scale" for test that covers the selected range of ten years, from age seven to age seventeen. At the present rate of the average pupil, the seven years from age seven up to age fourteen enables him to master only about seventy percent of the course. This seventy percent, however, is not to be taken as a standard for the attainment possible for the average pupil at age fourteen, although his learning aptitude (mental age) will remain at this age for the end of age thirteen, or of the eighth grade.

Aptitude age is a statistically determined ability to respond successfully to a definite testable complexity of mental experience which has been determined as the average ability of minds of that chronological age. The aptitude age is, therefore, a definitely determined chronological age. The age of fourteen is fixed as the aptitude age of the average person of that chronological age.

Attainment age for success in acquiring a usuable knowledge of the elementary course of study is at present statistically determined as that success found to be acquired under the teacher of average ability, with the average textbook and other school equipment, and the average number of years of schooling; and under these averages the success of pupils is determined by a particular organization of test questions, and by scores called *standards* for school success at each grade. Since there are so many different variables in this educational situation, any plan to measure the effect of a change in any one, or in all of them, falls back upon the adjustment which can be made of one or all to the actual relations of the learning aptitude (mental age) of the individual pupils to teaching success.

To measure this relation evidently requires some way of measuring the two different situations, one for aptitude age and the other for attainment scores, on the same common scale of reference.

THE SCALE MAKES COÖPERATIVE EXPERIMENT DEFINITE

But such a common scale of reference does not by itself give an answer to the critical educational problem of the school. Such a measurement in common units is only a tool to be used by administrators, teachers, and students of school problems, by means of which records of the results of directed instructional experiences and careful experiments can be made. The large problem concerns the instructional purpose and technique by which school training and pupil interest and effort can secure that fuller use by each pupil of his own learning aptitude needed to master more of the elementary course of study by the age of fourteen, although his aptitude age is perhaps only thirteen or even less. There is evidence now that some good schools get educational results of a year or more beyond what present standards prescribe for the pupil's grade learning aptitude. The grade aptitude age given on the common scale of reference marks the chronological age at which the average pupil has the ability to gain the present grade standard in school work without the help of expert teaching and equipment. He can make this grade, and does, in classrooms providing for very ordinary instruction, since the standards accepted are determined by using many such classrooms. Much carefully directed experience and experiment under actual school conditions is needed before the possibilities of advance in attainment through expert instruction within the ability of each learning aptitude age, will be discovered.

The question then is: How can school training make the best use of ability? Attainment age is a matter of that experience including experimentation by which the full effect of instruction and of interest and effort may become effective. It seems possible that at least ninety percent of the elementary course can be accomplished by the average pupil at the end of ninth grade at age fifteen, and he can then be ready to do good work in the senior high school.

AN OBSERVER.

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

COOKE, DENNIS H. *Minimum Essentials of Statistics: As Applied to Education and Psychology* (New York: The Macmillan Company, 1936), pp. XVIII + 271. $2.75.

The author of this textbook in statistics is Professor of School Administration at the George Peabody College for Teachers. The book should be usable for classes in educational statistics for the author states in the Preface that it has gone through three complete experimental mimeographed editions. He states that he has included "All the essential and most widely used statistical measures" although "only the *minimum essentials* have been treated."

The opening chapter deals with the organization and classification of data and the next three chapters treat measures of central tendency, variability, and relative position. Chapter V is devoted to the normal probability and other frequency curves and the remaining five chapters to measures of reliability, correlation, relationship related to tests, partial and multiple correlation, and prognosis.

As the author states in the Preface, no mathematical training beyond that provided by high school algebra is required by the students who would use this book. The language is simple and easy and the explanations, for the most part, are clear. Points are well illustrated with concrete examples and there is a satisfactory number of well-drawn diagrams.

Throughout his book, the author makes extensive use of a set of scores taken from a laboratory exercise book by the reviewer and used with the consent of the author and publisher. These data are quoted on page 136 and are used on pages 2, 4, 7, 12, 20, 24, 33, 34, 37, 41, 42, 50, 53, 55, 57, 62, 71, 72, 93, 94, 96, 97, 98, 99, 104, 107, 108, 125, 126, 128, 138, 172, 173, 174, 180, 181, 182, 183, 185, 188, 198, 199, 201, 205, 208, 210, 211, 212, 213, 214, 215, 219, and 223.

On page 197, a table of zero-order correlations is quoted from the same source without permission and without acknowledgment of the source.

The book is remarkably free from computational errors. Apparently, it has been checked and proofread with painstaking care. There are, however, careless errors of expression, a few cases of misuse of terms, and some instances of lack of scholarship. The omission of "not" from a sentence on page 9 reverses the meaning. On page 16, we read "make the lower limit of each class interval divisible by the size of the interval." On pages 33-34, it is stated that PE "is a distance on the base line, as well as *a definite area under the curve.*" (Italics supplied) On pages 40 and 73 we find such expressions as "multiplying 13.1 times .98." On page 54, "we find that 15 percent of the scores . . . falls in the 30 interval." Apparently, what is meant is that there is a value in this interval below which 15 percent of the

scores fall. In most places the various percentile terms are correctly used but on page 59 we find that error which is so common in educational books and articles and which is illustrated by "the boys in the highest percentile." On page 84, the two figures of Diagram XIX are obviously incorrectly drawn. A decimal point is omitted on page 107. On page 109, we find, "Therefore, there are 40 chances in 100 that the true difference between the M's is *not* greater than 5, or 10 chances in 100 that the true difference is greater than 5." What becomes of the remaining 50 chances is not explained.

On page 133, we find, "With both measures available the problem is to select, between *eta* and *r*, the more accurate measure." Of course, what is desired is to find whether the relationship is sufficiently linear to make *r* practically useful. On page 142, we find, "Readily it will be seen that the PE_r in formula (40) is larger than PE_r in formula (37), *the ratio of the difference* being as .6745 is to .7063" (Italics supplied) when in fact the ratio of the *former to the latter* is as .7063 is to .6745. On page 144, "The other methods are treated in the references cited in Appendix A, in the event the student has occasion to use them." On page 162, "The index of reliability, therefore, is usually smaller than the obtained reliability coefficient." Of course, it is nearly always larger. On page 163 it is stated that, "The value of $\sqrt{1-r}$ may be read from Table XLV" but Table XLV does not contain values of $\sqrt{1-r}$. There is an incorrect subscript in a formula on page 166. On page 186, we find

$$\frac{9}{15} = \frac{\sqrt{1-.85}}{\sqrt{1-r_s}} = .58$$

Of course, it is r_s that is equal to .58. On page 189, a multiple correlation coefficient of .55 is cited and followed by, "meaning that achievement in plane geometry can be predicted with approximately 55 percent accuracy."

This book could be made into a usable textbook for it has good qualities. A teacher who knows the subject of statistics thoroughly can use the book in an elementary course, making the necessary corrections for the students as he goes along. But the book should be revised and the revisions should be checked by a competent scholar before it is published.

R. L. MORTON

Ohio University

RHINE, JOSEPH B. *Extra-Sensory Perception.* Publication of Boston Society for Psychic Research (Boston: Bruce Humphries, Inc., 1935), pp. xiv + 169. $2.50.

In *Extra-Sensory Perception,* Rhine reports a lengthly series of experiments which, if his interpretations are correct, give very strong support to the belief that it is possible to perceive, without the aid of the ordinary senses, an image which is held in another person's mind or which appears on a concealed card. In the experiments on clairvoyance, Rhine used decks of 25 cards, each of which bore a simple design. There were five cards of each kind—circle, rectangle, star, wavy lines, and cross. The deck was thoroughly shuffled and placed face downward on a table. The subject then attempted to call off the cards in proper order. In some trials each card was turned over and the accuracy of the call checked immediately. In other trials all 25 were called before any card was examined. The most common procedure seems to have been to examine each group of five after it had been called. It is this procedure which will be analyzed in detail. Since the subjects knew that there

were only five designs, chance alone would account for five correct calls in each deck of 25. In nearly 100,000 trials (including some on telepathy) Rhine's subjects averaged 7.1 correct out of each 25 (p. 162). With such a large number of trials the difference between 5 and 7.1 is so highly significant that chance alone can safely be ruled out as an explanation of the results.

The widespread publicity which Rhine's work has received is doubtless due to its "scientific" air. Very many trials were run. The effects of chance have been carefully considered and only those scores significantly higher than chance are presented as evidence of extra-sensory perception. Alternative explanations such as radiation from the cards, fraud or incompetence on the part of the experimenters, and the use of rational inference by the subjects are all discussed and discarded. Therefore, Rhine reasons, the results must be due to extra-sensory perception, and clairvoyance and telepathy are established on a firm scientific foundation.

This conclusion is so important, if it is justified, that there should be a very careful examination of all of the steps—experimental, logical, and statistical—by which it was reached. That examination reveals two striking facts which cast very strong doubt on the accuracy of Rhine's conclusion. The first is that he has not used the appropriate mathematical logic in computing the significance of a given score. The second is that rational inference has not actually been excluded as a possible explanation.

In computing the significance of the difference between a given score and five —the chance score—Rhine assumed that the calls were independent. The assumption is almost certainly wrong. Having called "star" five times in a given series will tend to inhibit further calls of "star." But if the calls are not independent, Rhine is not justified in using probability formulae which assume independence. Neither can probability formulae which assume complete dependence (comparable to matching two shuffled decks of the cards) be used, for even an amateur bridge player will be properly skeptical of the subject's ability to keep an accurate count of the five suits. The assumption of independence gives a smaller standard deviation of the scores than does the assumption of dependence. Thus, to the extent that the calls were mutually dependent events, high scores will occur with greater frequency than Rhine's statements lead one to expect. Since the calls were neither wholly independent nor wholly dependent, and since no one knows just where within these limits they fell, the data are not susceptible to analysis by probability methods and the significance of a given deviation from the chance score simply cannot be computed. Thus Rhine's many computations give an air of impressiveness to his data which is largely vitiated by his own experimental conditions.

Rhine discarded rational inference as a possible explanation of his results and claimed that even theoretically "there could be an inference made only in case all of one suit had been checked out in the first 20 cards of the pack" (p. 115). This is not strictly true. Any investigator who wishes to amuse himself for an hour can demonstrate that under the most usual conditions of the Rhine experiment (calling and checking five cards at a time) he can obtain an average of 7 to 8 correct guesses in 25 by using rational inferences. The first five cards must be guessed by chance, but if (for example) two circles should show up in the first five cards, one should avoid guessing circles in the next five. There are necessarily five remaining cards bearing

some other design, say a cross, to only three bearing circles. The chance that the second series of five will contain crosses is obviously greater than the chance that it will contain circles, so "cross" is the best guess for the second series of five. This method of guessing gives an average of 7 to 8 right per series whether the cards are called one at a time or five at a time. Certainly when it is possible, by rational inference alone, to make as good an average score as did Rhine's subjects by the supposed use of clairvoyance, the claim that clairvoyance is the only method left to account for the scores is no longer tenable.

A simpler demonstration of the principles involved in these criticisms of Rhine's method may be made by using a deck consisting of four cards, two of each of two kinds. The essential conditions are in no way changed by this simplification, but an understanding of just what is involved is made much easier. The method of analysis which Rhine uses, presupposing independent calls, would predict that if all four cards are called before the deck is examined, there would be, on the basis of chance alone: an average of two right in each series; a standard deviation of 1.00; and a 1 in 16 chance of getting all four calls right in a single series. Supposing dependent events, analysis will show that if the calls are all made before the deck is examined: the average will, as Rhine would claim, be two; but the standard deviation will be 1.16 instead of 1.00; and the chance of getting all four right will be 1 in 6 instead of 1 in 16. If the cards are turned one at a time as they are called, and if rational inference is used, the average for a number of series will be three correct per series instead of two. The difference between two and three, made consistently over a large number of series, would constitute, by Rhine's logic, a very important proof of clairvoyance.

This reduction in the number of suits and the number of cards in each suit in no way alters the principles involved in attempting to call the cards. It does throw into clear relief the defects of Rhine's technique.

Rhine has done a tremendous amount of work. It is unfortunate that it was not properly controlled when a much more adequate method of control is easy and relatively obvious. The composition of each deck of 25 cards should be decided by a purely chance procedure. There might be some decks in which no rectangles occurred, others might contain eight circles or only two crosses, etc. Only when the composition of each deck is a matter of chance will the probability theory which Rhine uses be applicable. It will then be possible for him to check up in the middle of a series without thereby introducing a significant improvement in score due to rational inference. If, under these conditions, Rhine gets records consistently higher than chance, his case will merit scientific consideration. At present, his conclusions are invalidated by two facts. He used inappropriate probability formulae, and he failed to exclude rational inference as an explanation of the records.

DAEL L. WOLFLE
University of Chicago

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

CAMPBELL, WM. G. *A Comparative Investigation of the Behavior of Students Under an Honor System and a Proctor System in the Same University* (Los Angeles: The University of Southern California Press, Southern California Education Monographs, 1935), pp. 95.

This is a report of a study made at the University of Texas to compare the behavior of students under two different systems, the honor and the proctor systems, in an attempt to eliminate dishonesty during the taking of examinations.

CHAMBERLAIN, L. M., and MEECE, L. E. *Women and Men in the Teaching Profession* (Lexington: University of Kentucky, Bureau of School Service, 1937), pp. 56.

The authors present a discussion, with tables and graphs, dealing with the distribution of men and women teachers throughout the United States, and making comparisons with other countries. A section is devoted to the issue of feminizing teaching, to salary problems, and the married woman teacher issue.

CHAMBERS, M. M., and OTHERS. *The Fifth Yearbook of School Law* (Washington: American Council on Education, 744 Jackson Place, 1937), pp. 144.

This is a report of 16 phases of school administration, each phase presented by leaders in the field of school law. The reports deal with recent decisions of the higher state and Federal courts involving public and private schools, and institutions of higher learning.

COOVER, J. E. *Note Script-Reading Text.* (Stanford University: The Note Script Publishing Company, 1937.

The author, as the result of extensive experimental research offers a system of condensed writing for note taking. While it takes twice as long as shorthand, it saves 70 percent over longhand.

ELLIOT, EUGENE B. *Developing a Schedule of Behavior Records for Use in Elementary and Secondary Schools* (Lansing: Department of Public Instruction, 1937), pp. 38.

This report is one of a series of basic curriculum studies developed under the sponsorship of the State Department of Education at Lansing. This study attempts to develop a technique for recording behavior of pupils in the elementary and secondary schools.

HANSEN, GEORGE H. *A Regional Redistricting Plan for the State of Utah* (Provo, Utah: Brigham Young University Press, 1937), pp. 52.

This is a condensed report of a study dealing with a plan for redistricting the

state of Utah. The author points out the present inefficiencies and outlines proposed changes in the various phases of state organization that is felt would benefit the state as a whole.

MAY, MARK A., and DOOB, L. W. *Competition and Coöperation* (New York: Social Science Research Council, 230 Park Avenue, 1937), pp. 191.

The authors present a theory of competition and coöperation, followed by a discussion of the experimental, sociological, anthropological, and life history approaches to the field. There is also a section on prediction and future research.

PAUL, J. B. *A Study of the Grades Assigned to Students by the Faculty of the Iowa State Teachers College During the 1935-36 Academic Year in Courses Giving College Credit* (Cedar Falls, Iowa: Bureau of Research, Iowa State Teachers College, 1937), pp. 23.

This is a report, in graphic form, of the grades assigned to students of the Iowa State Teachers College, listed by individual instructors, by departments, and according to college rank.

PETERS, C. C., and OTHERS. *Abstracts of Studies in Education at Pennsylvania State College* (State College: School of Education, The Pennsylvania State College, 1937), pp. 153.

The author has prepared abstracts of 27 studies that have been carried on at The Pennsylvania State College.

SMITH, DAVID EUGENE. *The Wonderful Wonders of One-Two-Three* (New York: McFarlane, Warde, McFarlane, 6 East 45th Street, 1937), pp. 47.

The author has prepared a textbook for pupils beginning work in numbers. Beginning with the story of numbers, the various sections are prepared with special emphasis on child interests. Illustrations are prepared to add to the child's interests.

Statistics of Public High Schools, 1933-34 Biennial Survey of Education in the United States, 1932-34 (Washington: Office of Education, United States Department of Interior, 1937), pp. 75.

This report includes data on 23,213 high schools in the United States, and 164 in the outlying parts of the United States. Graphs and charts are presented showing enrollment, organizations, courses, etc.

ADMINISTRATION AND SUPERVISION

EMMERT, E. R. "Teacher Demand and Teacher Turnover in the High Schools of Ohio," *Educational Research Bulletin*, XVI (Columbus: Ohio State University, Bureau of Educational Research, April 14, 1937), pp. 92-96.

The author presents data on teacher demands and teacher turnover in the secondary schools of Ohio.

METHOD OF TEACHING AND LEARNING

MCCULLOUGH, CONSTANCE. "Improving Reading Comprehension in Grade IX," *The School Review*, XLV (April, 1937), pp. 266-273.

The author reports the results of a study carried on in the Edison High School, Minneapolis, in which the reading ability of pupils was improved with some gain in pupil achievement.

CURRICULUM

HAYWARD, W. G., and ORDWAY, NANCY M. "Vocabularies of Recently Pub-

lished Preprimers," *The Elementary School Journal*, XXXVII (April, 1937), pp. 608-617.

The author presents an analysis of the vocabularies of 15 recently published preprimers.

WILLIAMS, C. L., and WHITAKER, RUTH L. "Diagnosis of Arithmetic Difficulties," *The Elementary School Journal*, XXXVII (April, 1937), pp. 592-600.

The author presents an analysis of the arithmetic difficulties of 516 Chicago elementary school pupils.

CHILD WELFARE AND GUIDANCE

MCFARLANE, J. W., HONZIK, M. P., and DAVIS, M. H. "Reputation Differences among Young School Children," *Journal of Educational Psychology*, XXVII (March, 1937), pp. 161-175.

The author presents data on the validity of the "Guess Who" technique as a means of measuring reputation differences among school children. The agreement among the children with respect to their judgment of each other was fairly good for 82 percent of the children.

MEASUREMENT, STATISTICS, AND SCIENTIFIC TECHNIQUE

LINK, HENRY C. "A Test of Four Personality Traits," *Journal of Applied Psychology*, XX (October, 1936), pp. 527-534.

A preliminary report upon a test of personality traits: extroversion, social initiative, economic self determination and sex-adjustment.

MANWILLER, C. E. "Constancy of the I.Q. Based on Group Measurement," *Pittsburgh Schools*, XI (March-April), pp. 125-143.

From a study of Pittsburgh elementary school pupils the variability in I.Q. was found to be about six points.

TINKER, M. A. "Reliability and Validity of Eye-Movement Measures of Reading," *Journal of Experimental Psychology*, XIX (December, 1936), pp. 732-746.

A statistical study of the reliability of eye-movement measures of reading. Five to six lines were found to be adequate for group measurement and twenty lines for individual diagnosis.

YOUNG, C. W., and ESTABROOK, G. H. "Report on the Young-Estabrook Studiousness Scale for Use with the Strong Vocational Interest Blank for Men," *Journal of Educational Psychology*, XXVII (March, 1937), pp. 176-187.

The authors present data on a non-intelligence factor found to be useful in predicting scholastic achievement.

NEW TESTS

BAKER, H. J., and LELAND, BERNICE. *Detroit Tests of Learning Aptitudes*. Bloomington, Illinois: Public School Publishing Company, 1935.

This is an instrument of mental diagnosis, developed as an outgrowth of the demand for a measure of learning aptitude. The test consists of 19 sub-tests, to be given individually, to pupils from 4 to 21.

MELBO, I. R. *Melbo Social Science Survey Test*. Bloomington, Illinois: Public School Publishing Company, 1937.

This is a new survey test designed to measure a knowledge and understanding of the major trends, the direction of their movements, and the present status of im-

portant 'currents of events.' The test deals with the major contemporary social, political, and economic problems and issues in American life.

OTIS, ARTHUR S. *Otis Self-Scoring Mental Ability Tests.* Yonkers-on-Hudson: World Book Company, 1937.

This is a new series of intelligence tests, the Alpha test for grades 1 to 4, and the Beta test for grades 4 to 9. The Alpha test is non-verbal, consisting entirely of pictures and designs. By means of the special perforated key both tests can be corrected very easily and quickly. The validity and reliability is given.

RINSLAND, H. D., and BECK, R. L. *Natural Test of English Usage.* Bloomington, Illinois: Public School Publishing Company, 1934.

This test, for grades 9-12 and college freshman, is divided into three parts; test I, mechanics, covers capitalization, apostrophe; test II, grammar, covers adjectives, adverbs, pronouns, prepositions, and conjunctions; test III, rhetoric, covers sentences, with meaning not clear, paragraphing, sentence structure, and careless omissions and repetitions. These tests are valuable for diagnosis and for classification.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Statistical Summary of Education.—According to the U. S. Office of Education, for every pupil in school there is an investment of approximately $400 in school property. The total estimated value of school property in the United States, plus endowments, is $12,050,000,000. In 1929-30 the annual cost per adult for public education in the United States was $44.34, which had decreased to $30.51 in 1933-34. The total income for education, public and private, from kindergarten through college, decreased 22.6 percent from 1929-30 to 1933-34. For publicly controlled schools and colleges the decrease in receipts was 21 percent from 1930 to 1934, and for privately controlled schools 29.8 percent. Expenditures for public and private education, including current expense, capital outlay, and interest for all levels of education were $2,294,896,416 in the year 1934, a decrease of approximately $965,000,000 or 29.8 percent from 1929-30 expenditures.

Despite a decrease of 21,061 teachers in public elementary schools from 1932 to 1934, there were 7,124 more men teachers employed in 1934 than in 1932.

About one-fourth of the total population of the United States attends full-time day school; the number in 1933-34 was 30,612,948. By levels of education 23,262,371 were in elementary schools, 6,096,488 in high schools, and 1,055,360 in higher education, not including private commercial and nurse-training schools. About 27,150,000 or 89 percent were in schools under public control and 3,365,000 or 11 percent were in private schools.

The estimated education of all persons 21 years of age and over in the United States is as follows:

Education in 1934	*Number*	*Per Cent*
College graduates	2,204,000	2.93
Some college work	3,069,000	4.08
High-school graduates only	5,153,000	6.85
Some high-school work	14,285,000	18.99
Elementary-school graduates only	14,049,000	18.68
Some elementary school work	32,781,000	43.58
Illiterates	3,675,000	4.89
TOTAL	75,216,000	100.00

Study of Local School Units.—The United States Office of Education has conducted a study of some 40,000 local school units in the states of Arizona, Arkansas, California, Illinois, Kentucky, North Carolina, Ohio, Oklahoma, Pennsylvania, and Tennessee. More than 50 different kinds of local units were discovered. One state had approximately 12,000 units, while another reported only 167. The investigation was made for the purpose of improving school organization through discovery of more satisfactory local administrative units.

Research in the Field of School Buildings.—The American Council on Education, in coöperation with T. C. Holy of Ohio State University, is studying a proposal for a program of research in the field of school buildings. Illustrations of the types of problems which need fur-

ther investigation are as follows: the amount of floor space per pupil in classrooms, maintenance cost of buildings in relation to size and type of construction, heating and ventilation, selection of site and location of building, and school plant depreciation and obsolescence. It is planned to appoint a committee which will collect and disseminate research studies which have been made but not published, grant small subsidies to individuals for making investigations, set up controlled experiments at a center or centers where the necessary facilities are available, invite the assistance of appropriate organizations and institutions, make provisions for publication and distribution of findings, secure research fellows to carry on certain studies, and arrange for exploratory conferences to consider and organize the research program in certain of the larger areas of investigation.

Secondary School Standards.—The Coöperative Study of Secondary School Standards has developed a series of fourteen pamphlets which include extensive checklists, criteria, and statements of principles for the evaluation of secondary schools with respect to their staff, plant, administration, and educational program and outcomes. Although at present this material is purely tentative and experimental and is not intended for publication, reproduction, or general circulation, as a result of three months experience in the field, the Committee has authorized a limited distribution to individuals who have a special interest in the criteria, and who by their criticisms and suggestions may aid in further refinement and improvement of the check lists. Accordingly, one complete set of the tentative criteria will be sent without cost upon request to individuals who are definitely interested in them. Additional copies for the use of graduate classes, seminars, study groups, or faculties can be furnished at cost, 60 cents per set, or 5 cents for each pamphlet where duplicates of the entire set are not needed, provided cash in advance is sent to cover the small but necessary charge. Requests should be sent to W. C. Eells, 744 Jackson Place, Washington, D. C.

Teachers and WPA.—Charles E. Miner, Illinois WPA Administrator, reports that for the entire United States 40,132 teachers were certified to WPA, of whom 30,907 were family heads. Of the total number, 30,614 were women, of whom 22,366 were priority wage earners.

Slater Fund.—The joint budget for the Slater and Jeanes Funds, 1936-37, is $196,404. The total amount distributed by and through the Slater Fund, 1882-1936, is $4,298,238. These funds have been expended in the interest of Negro education in the south, particularly with reference to colleges and secondary schools, county training schools, and Jeanes teachers.

Psychological Meeting.—The next meeting of the International Congress of Psychology will be in Paris, France, July 25-31, 1937.

Test Service.—The Coöperative Test Service is a non-profit agency established in 1930 by the American Council on Education, with a subvention from the General Education Board, for the purpose of aiding in the difficult task of supplying comparable tests in the basic academic fields to secondary schools and colleges. The Service has devoted its attention to the preparation of objective examinations which educational institutions will find useful both in improvement of the curriculum and in guidance of individual stu-

dents. Three new services have been inaugurated:

(1) The publication of a Revised Series of tests which can be administered in a single class period. The regular Coöperative tests, which will continue to be issued, require two or more class periods for administration.

(2) The use of an electrical scoring machine which will reduce the cost and labor of hand scoring. Until local schools are equipped with such machines, the Coöperative Test Service will provide national scoring facilities at a low cost, beginning in the fall of 1937.

(3) The preparation of Scaled Scores which will simplify the interpretation of the results of the Coöperative tests.

Financial Advice.—The Financial Advisory Service was set up in September, 1935, by the American Council on Education to round out its program of assistance and service to colleges and universities by dealing with problems of business and financial administration. The purpose of the Advisory Service is to study problems of educational finance and to assist institutions and educational organizations in dealing with these problems.

The Service has already published six bulletins: "College Finance," "Depreciation of Real Property in Educational Institutions," "The Balance Sheet in College and University Reports," "Current Investment Practices of Colleges and Universities," "Current Practices of Colleges and Universities in Obtaining Professional Counsel for Services," "Fitting the Accounting System to the Plan of Reporting Recommended by the National Committee on Standard Reports." An article entitled, "Suggested Treatment of Relief Funds," and two book reviews have been published in the *Educational Business Manager and Buyer.*

In course of preparation are studies of endowment income, management of endowment, principles for institutional business management, training of business administrators for colleges and universities, and an analysis of current financial reports. Also in preparation is a comprehensive manual of accounting for small colleges. All materials published by the Financial Advisory Service are distributed free of charge to all institutions of higher education.

Papers or informal talks discussing the work of the Service or problems of financial accounting and reporting have been given at a number of the meetings such as those of the Association of American Colleges, Association of University and College Business Officers of the Eastern States, Maryland State Association of Certified Public Accountants and Cost Accountants, American Association of Teachers Colleges, American Association of Junior Colleges, Southern Association of College and University Business Officers, Board of Education of the United Lutheran Church of America, Board of Education of the Northern Baptist Convention, and the General Education Board of the Church of the Brethren. The Service has been represented at many other meetings such as the Conference on Problems of Business Administration of Colleges and Universities, conducted by the University of Chicago, and the annual meeting of the Association of University and College Business Officers of the Middle West.

The Service took the initiative in proposing the organization of a Regional Association of Business Officers of institutions on the Pacific Coast and participated in its first meeting. It has sponsored an accounting conference for the New England and North Atlantic States in New York City which was attended by representatives of 50 institutions in 12

states, by accountants from 8 firms, and by representatives from the United States Office of Education. It plans a similar conference in coöperation with the Southern Association of University and College Business Officers at its meeting in Louisville, Kentucky, next Spring.

The Service has been constantly advising administrative officers of colleges and universities through analyzing and commenting on reports submitted by the institutions, and through offering suggestions and advice in regard to a great variety of problems. It is coöperating with the American Association of Teachers Colleges in the adaptation of the recommendations of the National Committee to their own particular needs, and has been requested to coöperate in a similar manner with the American Association of Junior Colleges. It is also endeavoring to encourage states to use report forms which follow the recommendations of the National Committee. Texas, Oklahoma, New York, and Tennessee are all requiring institutions under their control to submit reports in such form.

Members of the staff of the Service have participated in a number of surveys of institutions and systems.

In building up files of financial reports of colleges and universities, reports of the proceedings of various conferences on financial problems, and bibliographies relevant to such problems, the Financial Advisory Service is fast becoming the central clearing house and repository of information on problems of financial administration of institutions of higher education.

This information was provided by John B. Goodwin, Technical Associate of the Service.

Emotion and the Educative Process.—At a meeting in New York on January 23, 1937, the Committee on Emotion and the Educative Process of the American Council on Education voted to recommend to the Executive Committee of the Council the publication of the reports prepared by Daniel A. Prescott and by Frederick H. Lund.

Dr. Lund's report includes a resumé of the experimental studies dealing with the physiological bases of emotions, laboratory techniques for evaluating various aspects of emotional behavior, and the paper and pencil test for studying the emotional characteristics of human beings. He has reported experiments with animals, as well as with human beings, and has paid special attention to the experimental techniques used and the apparatus developed.

Dr. Prescott's report discusses contemporary trends in theories about: the nature of the emotions, their trainability, and their role in personality development. The last part of this report deals with educational aims, organization and methods, and personnel relationships in education. In each case the implications of current theories are discussed and suggestions about needed research are presented.

Several rather new concepts about emotions are set forth. One of these is that emotions are not primarily disruptive but are more often adjustive. In this connection it is pointed out that the physiological aspects of emotional behavior vary with the intensity of the emotional reactions produced by the situation. Situations which produce only mild emotions are found to be tonic to nearly all normal body processes. Situations producing strong emotions result in the mobilization of the body resources for intense activity or else in the depressing of normal body processes in such a way as to conserve the energy resources of the individual until some measure of adjustment is secured. It is only when emotions have

continued over a considerable period or have reached their level of unendurable intensity that their action is truly disruptive to mental and visceral processes, and that breakdowns ensue. In the light of these findings it is easy to understand why people normally seek mild emotion with its increased tonicity. It is also apparent that it is not out of place for schools to provide opportunities for vivid experience.

The second important finding of the study is that emotions are not primarily a function of the stimulating situation, but that they depend upon the relationship between the stimulating situation and the basic personality needs of the individual. To make this clear, it has been necessary to undertake a tentative formulation of personality needs. The latter fall into three main categories: biological needs, social needs, and ego needs.

The biological needs are primarily needs for function appropriate to the structure and to the dynamic bio-chemical equilibria of the organism. This implies that individuals normally seek food, shelter, sexual expression, activity, and rest, and that the frustration of these needs results in emotional tension and the incomplete maturing of the personality.

The second group of needs is social. One of these, the need for affection, implies the need for various special relationships between the individual and other persons. These relationships naturally change their form and expression from time to time as the individual grows older, involving the need for mother love and familial affection in childhood, and the love of persons of the opposite sex in adolescence and early adulthood culminating in marriage and the rearing of a family. The second type of social need is the need for status within the groups in which the individual functions. Like the need for affection, this is a continuing and changing need, involving the need for an accepted and valued role in the family, play groups, and school groups during childhood, and in occupational, religious, social, and civic groups in adulthood.

The third group of needs is more difficult to characterize. One of these needs is for rich experience that will serve to orient the individual in the physical, social, aesthetic, and ethical aspects of reality. Another need is for increased freedom to direct one's own behavior. The third need is for the development of a sense of worthy selfhood based upon increased effectiveness of function, upon the crystallization of value concepts that are in accord with reality, and upon success in working toward goals which grow out of these value concepts.

The general conclusion of the report would be that teachers should play the role of personnel workers rather than of instructors and task-masters. The function of education is seen as that of affording experiences to children through which they may learn effective behavior for the achieving of their personality needs. This implies that education in the past has been over-intellectualized and not sensitive enough to the implications of its own processes for personality maturing. Maturity cannot be regarded as a state susceptible of accurate description involving specific patterns of behavior made habitual. Rather, maturity must be regarded as evidenced by the employment of behavior patterns appropriate to the age, cultural background, and society in which the child finds himself. Maladjustment is seen as arising from lack of capacity to profit by experience, from the effects of inappropriate experience, from the influence of environments which insist upon frustrating basic needs, and from the development within the individual of attitudes and value con-

cepts which are incompatible with each other, and hence leave the individual in a state of continuous mental conflict. The role of attitudes in delineating the areas of emotionality in an individual is stressed. Consequently the functions of education in guiding the development of attitudes is seen to be of paramount importance.

The report is now undergoing final editing and revision and should be published by the American Council on Education sometime during this spring.

This summary statement was prepared by Daniel A. Prescott, Chairman of the Committee.

Motion Picture Project. — Under a grant from the General Education Board, the Educational Motion Picture Project of the American Council on Education has been established at 744 Jackson Place, Washington, D. C., as a clearing house of information and a focal point for the mobilization of activities related to motion pictures and allied visual aids in education.

While the activities of the Project for the past year have been largely organizational, progress has been made in the development of basic materials and in the initiation of experimental procedures intended to facilitate the production, distribution, and use of educational motion pictures.

As a point of departure for the production of new films, a catalogue of existing films of educational significance is being prepared for use by research and distribution centers throughout the country. Approximately 7,500 films will be included in this catalogue upon its completion. Three sections have been prepared in mimeographed form, covering subjects classified under the Dewey-decimal system as (a) Sports, Games, and Amusements, (b) Sociology-Social Science, and (c) Physics as a Pure Science. These sections and others to be issued from time to time will be made available to research groups which undertake study of the present state of film supply in various fields of subject matter, needed areas of new production, and technical and pedagogical techniques effective in various types of educational motion pictures. They will also be made available to centers throughout the country which are undertaking widespread distribution of educational films. Because these film lists are unevaluated, they are not intended for general distribution. For the teacher and school administrator, a selected catalogue of educational films has been published by the H. W. Wilson Company, New York City. Quarterly supplements are being issued by this company.

An experimental evaluation study of existing films has been undertaken by a committee of the National Section on Women's Athletics of the American Physical Education Association. This study is in progress and will be completed within a year. Daniel C. Knowlton of New York University has been appointed chairman of a committee of the National Council for the Social Studies to consider methods by which social studies films may be evaluated. The American Council on Education will make catalogue materials available to other professional organizations, universities, etc., for such studies and will coöperate in the preparation of evaluation forms, location of evaluation centers, etc. At present the Motion Picture Project is making a study of the methods of evaluation employed by various school districts throughout the country. This study will be published in the spring of 1937.

During the past year the Council has coöperated with committees of the American Psychological Association and the Society of American Bacteriologists in

studies of motion picture production and use by university departments. A report on the coördination of motion picture activities at the University of Minnesota, through the establishment of a Department of Visual Instruction which produces, distributes, and services films and projection equipment for the entire university, has been prepared by Robert A. Kissack, Jr., director of the department, and will be published this spring in the yearbook of the *American School and University*. The activities of the American Psychological Association, the Society of American Bacteriologists, and the University of Minnesota tend toward coördination of college and university production and use of educational motion pictures and toward an elimination of waste and duplication.

The Educational Motion Picture Project is also interested in assisting in the expansion of facilities for the distribution of educational films to schools and colleges. In the fall of 1936 a *National Directory of Visual Instruction* was compiled by the United States Office of Education in coöperation with the American Council on Education and published by the latter. This directory lists the audio-visual equipment reported owned by elementary and secondary schools of the country and the name of the individual in each district in charge of or most interested in this equipment. It is intended to supply information basic to the development of film distribution programs. A further study of the use made of these materials is being made and will be published this spring.

Recent activities in the film distribution field include the establishment of a film library by the Division of General Extension, University System of Georgia, in Atlanta, and the establishment of a Los Angeles branch of the University of California Extension Division film library, formerly centered exclusively at Berkeley. Activities in Nevada are pointing toward the establishment of a state film library. In Pennsylvania the Department of Public Instruction is planning to develop coöperative film libraries in connection with its state teachers colleges. Two of these institutions now maintain such libraries. By making information regarding these activities available to other centers, the American Council on Education acts as a clearing house and aids in further development.

Through the preparation of various materials and through a series of regional conferences, the Motion Picture Project is assisting in the development of a program of teacher education in the use of visual aids. A syllabus on teacher training in visual instruction is being prepared by a subcommittee on teacher education in visual aids, of the American Council on Education, and will be available for use in teacher training institutions this summer. There will also be available to teachers in training, as well as to administrators and teachers in service, a handbook on administrative practice in visual instruction. This handbook will be published as one of the American Council on Education studies, and will be available at the Washington office of the Council. Also in preparation for publication this spring by the H. W. Wilson Company is a digest of pertinent literature in the fields of administration, preparation, use, research, evaluation, and teacher education in visual aids. This material is being prepared under the auspices of the American Council on Education by various individuals connected with the Motion Picture Project.

Regional conferences on problems of teacher training in visual aids have been held during the fall of 1936 and the

spring of 1937 at Milwaukee in coöperation with the University of Wisconsin, in New York in coöperation with Teachers College, Columbia University, and in Ocala, Florida, in coöperation with the General Extension Division of the University of Florida and the Florida State Teachers Association. Reports of these conferences are being published in mimeographed form and will be available at the American Council on Education at nominal cost. Training in visual instruction is required for permanent certification of teachers in Pennsylvania, and is being required for graduation from New Jersey state teachers colleges next year. It is also being introduced next year in the state teachers colleges of Massachusetts. Nearly one hundred institutions of higher learning in the summer offer courses dealing with visual instruction.

The activities of the American Council on Education in the educational motion picture field are under the direction of a committee consisting of John W. Abbott, Museum of Modern Art Film Library; W. W. Charters, Ohio State University; Frank N. Freeman, University of Chicago; Ben G. Graham, Pittsburgh Public Schools; Mrs. Mary Langworthy, National Congress of Parents and Teachers; and Mark A. May, Yale University. In active charge of the project is Charles F. Hoban, Jr., who prepared this statement.

Art Education Project.—The Owatonna Art Education Project has as its chief purpose the development of a course of study in art which is truly vital and functional, and based upon the art needs of American life. For the purposes of the study, Owatonna, Minnesota, a "typical" community, was selected and a survey made during the first year of the project (1933-34). The survey involved visits to homes, and to commercial, industrial, and civic establishments. Members of the staff were asked to help in the solution of art problems confronted by members of the community in their daily living. From time to time classes have been organized among various groups. Clubs, organizations, and civic groups have requested talks and discussions on a large variety of problems.

From the work in the community, results have been derived which have acted as the basis for the development of the course of study. These results have not been in terms of present practices, but rather in terms of the types of art which people use and need, and the activities in which they use and need them. For example, in the survey of house interiors, curtains and their design were considered. There was no attempt to seek a perfect solution of the curtain problem, for in isolation no such thing exists. Rather, it was noted that the problem of curtaining a window was only one of a number of closely related problems and capable of varied solutions; that it was one that could be solved more satisfactorily than was generally the case; and that it was a part of a larger field of art activity, the home. Thus, the art teaching which results from the use of the survey does not have as its aim the maintenance of the *status quo*.

In the course of study the following features are present: (1) art is being considered in terms of areas of activity, such as the home, community, etc.; (2) a great deal of subject-matter is being included in the art course, which is usually slighted or is not considered as material for art teaching, such as a study of garden design, industrial products, etc.; (3) the contemporary aspects of art are being stressed at the expense of the historical; (4) and the development of technical skills is being minimized.

The project is financed by the Carnegie Corporation of New York and conducted by the University of Minnesota. M. E. Haggerty, University of Minnesota, is the director. Edwin Ziegfeld is resident director. The project will run until the spring of 1938.

Developments in Secondary Mathematics.—The major purpose of the National Committee on Mathematical Requirements was to give national backing to certain reforms in the teaching of mathematics that had been advocated by leaders in the field during the preceding thirty years. The report of the Committee appeared in 1923.

During the time the National Committee was preparing its report a new organization was formed, known as the National Council of Teachers of Mathematics. It took up the task of promoting the interests of mathematics, and of assisting in the adoption of the recommendations proposed in the report of the National Committee, and in carrying on the work necessary to achieve the desired reorganization.

The Council was a success from the beginning. It has enjoyed a steady growth and now has a membership of over 4,500 distributed geographically over the entire country. So successful has been the work of those who have directed the work of the Council that at the last session in February, 1937, in Chicago the meetings were attended by over one thousand people. The association has by no means reached its highest development and the aim of the directors to reach in time a membership of ten thousand seems entirely reasonable.

When the National Council was organized the *Mathematics Teacher*[1] became the official journal of the association. Since then it has developed to the point where it is now perhaps the most helpful single force in the improvement of the teaching of mathematics in the secondary schools in this country.

In 1926 the National Council began the publication of Yearbooks.[2] So far, twelve yearbooks have appeared. Like the journal, each of these yearbooks has been a success. They are in demand because they contain a vast amount of information and research touching upon most of the important phases of mathematics. The teachers of mathematics realize that they cannot afford to be without them.

The most recent enterprise launched by the Council is the publication of a series of monographs edited by W. D. Reeve of Columbia University. The first of the series has just made its appearance.[3] If it is a sample of the others that are to follow, these monographs promise to accomplish a great deal of good for teachers of mathematics as well as for their pupils. It is written in a scholarly way, but simple enough to be read profitably and with pleasure by children of high-school age.

In addition to the work carried on by the National Council in its semi-annual meetings, in the *Mathematics Teacher*, and in the *Yearbooks*, a considerable part of the load has been carried by committees appointed by the Council.

In 1928 President Young of the Mathematical Association of America appointed a Geometry Committee. It was to study the problem of including some solid geometry in the course in plane geometry. The work was taken over in 1930 by a new committee appointed by

[1] The *Mathematics Teacher*, 525 West 120th Street, New York City. The subscription price of $2 a year includes membership in the National Council.

[2] The Yearbooks are published by the Bureau of Publications, Teachers College, Columbia University, New York City.

[3] *Numbers and Numerals*, Monograph No. 1. Bureau of Publications, Teachers College, Columbia University, New York City. $0.25.

the National Council. The report of this committee was published in the *Mathematics Teacher* in May, 1931. It submitted two tentative courses combining plane and solid geometry: a tandem course and a fused course.

In 1932 the National Council appointed a Committee on Individual Differences. It was to investigate the merits of ability grouping and of differentiated curricula in mathematics. Reports of this committee appeared in the *Mathematics Teacher* in November, 1932; October, 1933; and April, 1936. A subcommittee on the administrative phases of the problem of individual differences made several reports. The final report appeared in the *Mathematics Teacher* in May, 1935.

A Committee on Geometry was appointed by the National Council to study the whole question of geometry in our schools, to stimulate experimentation in the teaching of geometry, and to make available the studies that have been made in this field. Three reports have been submitted by this committee. The first, which appeared in the *Mathematics Teacher* in November, 1932, outlined the problem and the committee's plan of study. A second report followed in October, 1933. The last report appeared in the October and November, 1935, issues of the *Mathematics Teacher*. The study of the committee was concerned with new types of examinations, difficulties of pupils, curricula, methods of experimentation, and college entrance examinations.

A Policy Committee was appointed by the National Council to bring together the most authoritative views on the educational significance of mathematics and of the guiding principles that should govern the work of the mathematics class room. A tentative program of the committee was published in the *Mathematics Teacher* in November, 1932. A second report followed in December, 1933. It was concerned with the nature of mathematics and its place in education, methods of teaching, and the growth of the teacher. A sub-committee was organized to report on transfer of training, improved methods, tests, workbooks, recreations, and a bibliography for the teachers of mathematics.

A Committee on Examinations has made two brief reports which appeared in the *Mathematics Teacher* in November, 1933, and May, 1935.

In addition to the foregoing reports, two others which did not originate with the National Council deserve mention. The first is the *Report of the Subcommittee on Junior High School Mathematics* which was published in the *North Central Association Quarterly*, March, 1928. The committee was appointed by the North Central Association. It submitted a detailed discussion of the objectives of junior high school mathematics.

The second publication is entitled *Instruction in Mathematics*. It appeared as Bulletin No. 17 of the National Survey of Secondary Education in 1932. It is a presentation of mathematics as it existed during the time the survey was made. Separate discussions were made for junior and senior high school mathematics.

One of the recent developments in the field of mathematics is the more active interest in the cause of secondary mathematics shown by the Mathematical Association of America. In 1933 it appointed a Commission on the Training and Utilization of Advanced Students of Mathematics. A report was published in the *American Mathematical Monthly* in May, 1935. It contained definite recommendations concerning the preparation

for major teaching in secondary mathematics. In October, 1935, a second report appeared in the *American Mathematical Monthly* which presented a bibliography of the psychology and methods of teaching, the teaching of algebra and geometry, supplementary reading, and reading for prospective college teachers of mathematics.

The most recent development in the field of secondary mathematics has been the appointment of a Joint Commission of the Mathematical Association of America and the National Council of Mathematics Teachers. This commission has just received a grant of $5,000 from the General Education Board and held a two-day session at Chicago on February 21 and 22. The purpose is to study the problems in the entire field from elementary to collegiate mathematics, to determine the part mathematics should play in general education, and to make recommendations. The commission is to continue the work of the National Committee on Mathematical Requirements. It has already taken over the unfinished work of the Policy Committee. Much is to be gained for mathematics from the recognition that reforms in secondary mathematics are related to the reorganization of elementary school mathematics and that reforms in college mathematics are similarly related to the reorganization of the subject in the high school.

It has been felt by many teachers of mathematics and by others who are interested in the subject that the questions relating to the nature of mathematics and its place in the general educational scheme have not been presented in recent years with sufficient force. It now seems that, with a constantly growing National Council and a Joint Commission which assures the interest and support of the college teachers of mathematics, there is every reason to believe that the case of mathematics will receive the hearing and recognition which it deserves.

The new impetus given to certain reform movements aiming to improve the teaching of mathematics promises also to accomplish much for the subject. Among these should be mentioned: the complete reorganization of the curricula of Grades VII, VIII, and IX which is rapidly taking shape; the trend toward courses in general mathematics; the changes in mathematical requirements in the new college entrance examinations; and the recent experimentation in the field of high-school geometry.

This statement was prepared by E. R. Breslich of the University of Chicago.

Relation of School and College.—The thirty secondary schools included in the Eight Year Study, now being conducted under the auspices of the Commission on the Relation of School and College of the Progressive Education Association, began their innovations in curriculum procedures in 1933 and sent the first class involved in the study into college last September. Approximately 1,100 boys and girls entered 170 different colleges. Four additional classes will enter college in the future and the study will end in 1941. By that time approximately 6,000 students will have entered college under this plan from the thirty schools and doubtless many colleges in addition to the 170, where the present freshmen now are, will be chosen.

The curriculum changes thus far can be grouped under the following headings: (1) greater continuity, (2) better integration, (3) more vital subject-matter, and (4) more satisfactory adaptation to individual capacity, needs, and interests.

First: Instead of more or less hap-

hazard collecting of units until a total of fifteen have been acquired, the pupils are being led into continuous experience throughout four and often six years in which skills, ideas, and concepts of earlier years are used again and again in new relationships and with new meanings. In these schools the continuity of experience and the unity of design for which the workers in charge hoped are being discovered.

Second: In almost all the schools there is emphasis upon integration or fusion of subject-matter, where that seems to be profitable. The teachers are attempting to discover the relationships between fields of study, to find the unity which exists in the nature of things, and then to teach together those things which belong together. It is believed that each field takes on added meaning for the student when he sees the significance of that field in relation to others studied. This involves a breaking-down of some of the barriers which have been erected between subjects and between teachers, and it clearly involves a broadening of each teacher's own point of view, including increased knowledge, understanding, and recognition of the importance of fields related to his own.

It should be understood that the schools have sought to keep the values inherent in the traditional high school curriculum. The sciences, foreign languages, mathematics, and other fields of work have not been abandoned, but there has been revision of content and reorganization within the traditional subjects to make them more profitable to the student and to secure a higher degree of genuine scholarship.

Third: All of the schools in this study are attempting to vitalize their work by changes in the organization, methods of teaching, and content of the curriculum. In the traditional subjects many schools are omitting material that seems of doubtful significance and adding new subject-matter which seems more important. Some of the schools are making extensive use of the community in which they are located, bringing the school and the community close together, guiding their pupils in the study and exploration of their environment, and bringing such portions of the outside world as seem desirable into the classroom. In many schools the general student life is rich in experience in community living. Advantage is taken of this to vitalize classes in many fields, especially the social studies. It seems to many observers that secondary schools have been neglecting their greatest opportunity for the development of habits and attitudes of social responsibility, and that this opportunity lies at hand in the school community.

Fourth: All of the schools are attempting to know and understand their students better and to adapt their work more satisfactorily to their needs, interests, and capacities. The workers in charge feel the need of help in this very difficult task. There is much to learn about the real needs of our pupils in these days, not only for adequate college preparation, but for satisfying living. There is a necessity, too, for assistance in exploring the wide range of genuine interests of boys and girls in providing adequate means for their satisfaction.

Each school is now making a careful study of its work in the light of experience thus far. As a result, there is some change of direction and some modification of original plans. The continuing study of basic urges, drives, and concerns of young people is making it possible for the schools to find new ways of meeting their needs. More attention is being given to the needs of young people for better understanding of themselves, their relations with others, the choice of

occupations, and the development of what might be called a philosophy of life. It has been found that these are universal interests of young people. They are deeply concerned with personal problems which involve clearer understanding of their physical, intellectual, and emotional natures. Relations with others involve their membership in families, their anticipation of establishing homes of their own, membership in various groups with their contemporaries, making and keeping friends, popularity, and particularly problems involved in establishing happy and wholesome relationships with the other sex. In choosing a vocation, they wish a comprehensive view of the work of the world and of the things that need to be done, and whether they possess the qualities necessary for effective work in the fields which appeal to them. They are not willing to accept a ready-made point of view concerning the major problems of human existence, but are deeply concerned with the development of their own ideas. They need something basic and fundamental upon which they can build their lives and are seeking the help of the school when it has anything to offer.

Changes and procedures in the schools involve much closer coöperation between administrators and teachers in determining school policies, more intimate coöperation of teachers with each other in planning and in carrying out curriculum changes, and a greater sharing by students in planning the work of the school.

The schools are coming to the conviction that the chief social responsibility of secondary education in the United States is the development of an understanding of the American democratic tradition, what it has meant throughout our history, and what its implications are for American life today. The schools are leading their students into a serious study of these problems and are attempting to organize school life so that the students may have abundant experience in democratic living in the school community, and an opportunity to share more fully in the life of the community outside the school.

Doubtless the schools will learn more fully than they now know, how to proceed and how to serve youth better, as the study progresses. When the study ends in 1941, a full and complete report, including a careful evaluation of results, will be published for wide distribution.

This statement was prepared by Wilford M. Aikin of Ohio State University, Director of the Commission on the Relation of School and College of the Progressive Education Association.

Recent Changes in Collegiate Education.—Four academic years have passed since 1932 when the survey of *Changes and Experiments in Liberal Arts Education* (Thirty-First Yearbook, Part II, of the National Society for the Study of Education) was published, and it is pertinent to inquire whether the trends noted at that time have continued and increased in importance or whether progress in collegiate education has chosen other roads for its advance. The American Association of University Women, which was responsible for the earlier study, has been keeping a continuing file of data on changes announced in collegiate education, and it is on the basis of this information that the following observations are made.

Most conspicuous, perhaps, during the four years just passed has been the continuation of the trend, marked in 1932, toward adjustment of the curriculum to the needs and interests of the individual student. This is a basic trend. It was observed indeed in 1932 that every significant development of the last twenty years had been in the direction of making curriculum and degree requirements more

flexible and better adapted to the variations in individual talent and incentive. Of late, several colleges—Goucher, Bard, and Elmira—have introduced completely new individualized curricula, built up separately for each student, with faculty advisers as the central feature of the program. Some institutions, for example, Mount Holyoke, have initiated curricula built for the individual for the benefit, not of the entire student body, but of selected groups of capable students. In many colleges the trend toward adapting the curriculum to the individual has taken the form of reducing or scrapping requirements for specific courses and of permitting the student to select and shape his course of study, subject to distribution within groups and to the advice of counselors.

The trend, brought out in the earlier study, in the direction of honors work, independent study, tutorial guidance, and comprehensive examinations has been emphasized in the four succeeding years, as an expression of the realization of the need for student self-discipline and self-education. A large number of colleges have either adopted programs of independent study and work under tutorial guidance or have made improvements in existing programs of this kind. Vassar and Yale have introduced comprehensive examinations in the major for all students as an important feature of their curricula, and the list of institutions reporting the first use or the extended use of comprehensive examinations is a fairly long one. Preparation for comprehensive examinations practically always involves reading which the student does on his own initiative and some degree of work under tutorial guidance.

As for the use of achievement tests and substitutes for course credits (a phase of change present in 1932), that too has gained rather than lost followers. More colleges are tending toward realization of the ideal that students should be placed where their proficiency warrants and should advance upon the evidence of achievement. A number of colleges have in these years introduced proficiency tests, by the passing of which students may fulfill certain requirements or may gain advanced credit. A few colleges have abandoned the machinery of course credits, marks, etc., and have substituted advancement upon the basis of achievement.

The years, 1933-36, have seen no movement toward significant deviations from the four-year homogeneous unit, a phase of experimental change found in the 1932 report to be outstanding because of measures taken at the University of Chicago and the University of Buffalo, making it possible for superior students to graduate in less than four years. However, a few colleges—Goucher, Bard, and Washington Square College of New York University in a curriculum for 200 selected students—have abandoned the machinery of the course-credit system and allow students to progress in conformity with the degree of their superiority as evidenced by achievement tests. Although these plans will probably result in no great deviation from the four-year unit for most of the students, a factor has been introduced that does conceivably facilitate graduation in less than the regulation period.

Another phase of experimental change described in 1932 (reorganization of content to emphasize fields of learning), is one that continues to be prominent, and indeed gains in momentum. The need for synthesis and integration, for seeing things whole and in relation, and for the abolition of barriers between subjects and departments, is being felt more and more and an increasing number of colleges are taking action to this end. Some institutions have combined a large num-

ber of departments into a small number of broad divisions in the hope of reducing arbitrary lines between related subjects. Others report departments reorganized and grouped in an effort to cause teaching and study to become broader in scope and to break down artificial barriers. A number announce the introduction of interdepartmental majors and an increase in interdepartmental instruction. The University of Wisconsin is approaching the problem through a Science Inquiry whose objective is to insure that, in the field of science, the university makes its attacks upon problems comprehensive, so that there may emerge at least the beginnings of integrated programs. In at least one university, Harvard, plans are being worked out for "roving professorships" free from departmental restrictions.

The sixth and seventh phases of change reported in 1932, namely, learning through experience and the junior year abroad, although continued in 1933-36, seem at present of less import as trends than the two outlined below, which have emerged as of major importance.

A trend gathering force is the emphasis upon the benefits of and the need for general education. This is resulting in the separation of curricula into upper and lower divisions, with the lower division assigned the function of giving a general education. Stimulated by the objective of the General College at the University of Minnesota, "general colleges" covering the first two years of work have been established, with certain essential differences in plan, at several universities, such as the University of Florida and the University of New Mexico. Other institutions, for example, Bucknell, Pennsylvania State College, University of Louisville, University of Pittsburgh, and the University of Southern California, have divided the four years horizontally into lower and upper divisions, or junior and senior colleges, with the expectation that a general cultural education will be provided in the first of the two units. In addition, there is a mounting recognition of the value of a broad, cultural, non-specialized education as preparation for the professions, and even as an element in professional education itself.

Finally, the last several years have witnessed significant changes in curriculum content. Colleges have made conscious and tangible efforts to offer courses designed to prepare students for the demands of present-day living in its recreational, social, civic, and cultural aspects. In particular, they have been extremely active in expanding curriculum offerings in the fine arts, music, dramatic art, and speech, and in developing programs preparing for citizenship and public service.

This statement was prepared by Kathryn McHale, General Director, American Association of University Women.

Arizona Studies.—The Department of Research and Guidance at the Phoenix Union High School, Phoenix, Arizona, is undertaking three major experiments this year, under the supervision of Lacey A. Eastburn, Director of Research and Guidance, and Victor H. Kelley, Guidance Counsellor.

1. The study pertaining to the effectiveness of large and small classes which has been in progress for three years is being continued. In this study the teachers of the "large classes" carry a larger pupil load than the teachers of "small classes," but have the same number of classes per day. A full time stenographer is also used by the three teachers in the large classes. A preliminary report of this work has appeared in the September, 1936, issue of the *Journal of Experimental Education.*

2. Preliminary work is being started in

a study of the reading difficulties of ninth-grade pupils. Difficulties reported by teachers, the results of standardized reading tests, and the results of school work are being analyzed in order to determine specific weaknesses. A program of remedial reading is then being developed to correct the difficulties found.

3. A study in the integration of high school subject matter is being started. Two teachers who have majors in both social science and English are jointly teaching a large class of twelfth-grade pupils in civics and English. The civics course is used as the background for both corrective English and literature. Double periods are used so that the students spend the same amount of class time as if they were taking separate courses.

A study by Nunley Stone entitled, "The Effect of Intensive Vocabulary Study on Average Achievement," concerns the possible effect of intensive vocabulary study by Mexican pupils on their work in English and on school work in general. The finding, with a relatively small group, is that such work is of value.

Gladys C. Finney made an investigation entitled, "A Comparative Study of the Relative Achievement of English and Spanish Transient and Non-transient Sixth Grade Groups." In general, the conclusions are that transiency, i.e., moving from one community and school to another, has a deterrent effect on good school work. This study shows that transiency is more prevalent with English (American) pupils than with Spanish (Mexican) pupils.

William B. Deeter carried on an experimental study to determine the effect of atmospheric conditions upon sustained attention. Using governmental readings on barometric pressure, humidity, wind velocity, and temperature as an index of weather conditions, and Morrison's form for observing sustained attention, he was unable to find any connection between any of the weather variables and sustained attention.

Laura O. Gale attempted to remove the "halo" effect of personality rating by having all teachers of pupils who studied geometry in her classes rate these pupils in one personality trait only each week, and then at a later time rate the same pupils in all of the traits at one time. She found the correlation between the two types of rating to be surprisingly high, and also that the ratings correlated with achievement in geometry much more highly than do intelligence scores. She decided that, if there was a "halo," it seemed to be present in both types of rating and that either type possessed high predictive power for subject-matter achievement.

A study was made by Francis H. Feeney on "Illiteracy Trends in Arizona," which shows that ninety percent of the illiterates of the State are Indians and Mexicans. The greater number of illiterates are found among the older groups of people, comparatively few illiterates being less than twenty years of age.

Francis R. Vihel made a study of "School Finance in Maricopa County." Differences in assessed valuations and in school costs in various districts of the county—city, high school district, elementary school district, and irrigation and drainage districts are especially marked, in some areas the debt equaling half or more of the valuation of the area. Recommendations regarding improved financial records and administration are outlined in the study.

Florence H. Van Bibber conducted an investigation of "Interests of Senior High School Students in Reading for Recreation." The data were secured by means of inquiry blanks submitted to 1,298 sophomore, junior, and senior pupils. The reading interests of boys and girls are, according to this study, quite similar. Also, there are comparatively slight differences between the interests of pupils of different classes. On the whole, the reading interests are commendable and are influenced by the type of reading materials available in the home.

William L. English made a study of "The Relative Value and Efficiency of Various High School Courses," which is based on the opinions of one hundred adults (fifty men and fifty women) who had graduated from high school three or more years previously. The most common benefits of a high school education are identified in terms of occupational value. An average of 5.82 courses in each four-year curriculum were considered entirely useless. Specific recommendations concerning the continuance or discontinuance of various courses are made as a result of this study.

A study was made by Everet Johnson, Director of Research and Guidance, in the elementary schools of Phoenix, to determine the relative difficulty in learning the multiplication and division facts together or separately. A representative group of over one hundred pairs of pupils over eighteen weeks was used for the study. It was found that in every group, results favored the combined method.

This information was provided by Everet Johnson of the Phoenix schools.

Birmingham Curriculum Program.—The present Birmingham, Alabama, Curriculum Program was initiated in August, 1935, for the purpose of improving instruction in both elementary and high school areas. The program as planned will extend over a period of several years and will involve the following major points:

1. The study of society, child development, principles of education, and the accompanying implications for curriculum reconstruction.
2. The collection, organization, and evaluation of new instructional materials and procedures, resulting from extensive exploratory work by teachers, principals, and supervisors.
3. The systematic try-out of the new instructional materials and procedures.
4. The re-evaluation and revision of the new materials and procedures.
5. The continuation of exploration, trial and evaluation, and a further revision of materials and procedures resulting ultimately in the publication of a tentative course of study.

The first year has been devoted to a preliminary study of the needs of society, child development, and the principles of education, as a basis for curriculum reconstruction. The study has been carried on in the monthly meetings of the principals and supervisors, the monthly meetings of teachers, principals and supervisors, and the weekly meetings of teachers in each school.

The topics discussed at the principals' and supervisors' meetings and at the grade meetings were as follows:

1. The nature of the curriculum.
2. Interests and purpose as bases for learning.
3. The nature and function of educational aims.
4. Subject matter and its contribution to education.
5. Evidences of need for improving instruction.

6. Pupil activity in relation to growth.
7. Organizing instruction.
8. Evaluating outcomes of instruction.

In an effort to determine society's needs the following major social functions were selected for study and surveying:

1. Conserving and improving human and material resources.
2. Earning a living.
3. Making a home.
4. Providing for transportation and communication.
5. Engaging in recreation.
6. Securing education.
7. Expressing religious impulses.
8. Performing the responsibilities of citizenship.
9. Expressing aesthetic impulses.

Each of these major social functions was assigned to a committee with the suggestion that it be studied from four different angles: What *is?* What *was?* What should be? and How to attain what should be (with implications for the curriculum). It was pointed out that the study of what *is* involved the use of surveys.

Each social function committee was composed of a chairman and several members who were either principals of schools or supervisors. Each principal member was the chairman of a sub-committee whose membership consisted of all of the teachers under his supervision. In this way all teachers, principals, and supervisors in the system were brought into the study. More than one-half of all the building meetings were scheduled for the study of the social functions.

The results of the first year's study are now being compiled and edited preparatory to publication as a bulletin which will contain nine sections, each of which is developed according to the following outline:

1. Existing conditions.
2. Needs.
3. Recommendations for Birmingham schools.
4. Leads to units of work.
5. Suggested readings.

Many aspects of the social functions were not surveyed or were inadequately surveyed. It is hoped, however, that this year's activity will lead on to further activity on the part of the teachers and that unsurveyed or inadequately surveyed areas will be given attention. Among the topics needing further investigation are these:

1. Crime and its prevention.
2. Juvenile delinquency and its prevention.
3. War and its eradication.
4. Local and state governments and their improvement.
5. Taxation.
6. Exploitation of children.
7. Exploitation of workers.
8. Distribution of wealth.
9. The economic structure and its improvement.
10. The conservation of natural resources.

The director of the Curriculum Department is I. R. Obenchain, who prepared this statement.

An Individual Pupil's Difficulties

(See previous page)

Pupil number four has a chronological age of 14-1. His aptitude age is 12-7, and his average attainment scale age is 14-11, or two years and four months above his aptitude age. His record on the tests is as follows:

PUPIL NUMBER 4

Scoring Record	% Score	Scale Age
1. Rate of Reading	91	16-1
2. Read. Comprehension	97	16-8
3. Vocabulary	88	15-10
4. Spelling	90	16-0
5. Addition	79	14-11
6. Subtraction	54	12-5
7. Multiplication	75	14-6
8. Division	54	12-5
9. Mean (lines 1 to 8)	79	14-11
10. Arith. Problems	40	11-0
11. Synonym-Antonym	75	14-6
12. Arith. Ingenuity	52	12-2
13. Mean Aptitude Score (lines 10 to 12)	56	12-7
14. Chronological Age		14-1
15. Attainment Scale Age		14-11
16. Aptitude Age		12-7

His scores on the four reading tests are near or above the scale age of 16-0.

His low scores are in subtraction, where he makes only scale age 12-5, and in division, where his age also is 12-5.

His difficulty in arithmetic is anticipated from his low scores on the aptitude tests for problem solving of age 11-0 and arithmetic ingenuity of age 12-2.

How far is the school responsible for this difficulty in arithmetic for a pupil very bright in other ways? A study of his work on the test exercises indicates that he is a faithful student in each subject. He evidently learned and tried to apply the rules for doing the arithmetic processes. His failures seem to come from difficulty to hold in mind two or three steps of a process for lack of an understanding experience of the relation of each step as a definite part of the thought process. In fact, he has not learned the language of numbers.

With an aptitude score of 12 years and 7 months, which is obtained on a scale in which two out of the three tests are on the relations of numbers, a type of instruction that would develop the needed thought experiences has chances in favor of success. The school might save him from the limitation of only a one-track brightness.

The above record of scores shows the simplicity of bringing together, under the one chronological age scale, the correlated scores of attainment and aptitude.

If interested, send for a complete sample set of the *Public School Correlated Attainment Scales.*

PUBLIC SCHOOL PUBLISHING COMPANY
BLOOMINGTON, ILLINOIS

The Teaching of Reading
A SECOND REPORT

The deservedly spectacular success of *The Teaching of Reading: A Second Report*, published as Part I of the Thirty-Sixth Yearbook of the National Society for the Study of Education, is one of the real thrills that its publishers have experienced during the past twenty years.

Within a few weeks after shipment had been made to members of the Society and to school administrators who had ordered in advance of publication, quantity orders of from three to seventy copies came in ever-increasing numbers. Such evidence of approval is the best that any book can have. We are sure now that *The Teaching of Reading* can be recommended unreservedly for study by teachers-in-service and in teacher-training classes.

The Teaching of Reading: A Second Report

Cloth $2.50
Paper $1.75

PUBLIC SCHOOL PUBLISHING COMPANY
BLOOMINGTON • ILLINOIS